

Designing a Remotely-Operated Vehicle (ROV)

Authors: Frank Barrows, Peter Davis, Lloyd Kitazono, Bob Smith

Guiding Questions

How do you retrieve five miniature barrels from the bottom of a swimming pool with an ROV?

Incorporation of SCANS:

In this module students will divide into teams and develop a preliminary plan for the construction of a proto-type ROV. The plan will include the budget, time-line, progress reports for the design, construction, and testing of an ROV.

Goals

- Introduce students to basic scientific and technical concepts related to the design of ROV's
- Introduce students to construction budgets, time-lines, and progress reports

Learning Objectives

- Articulate that an ROV is an appropriate choice for the retrieval project
- Define the subsystems of the ROV
- Design a preliminary budget for completion of the project
- Construct a preliminary time-line for completion of the project

Materials Needed

- Photos of ROV's and the working environment for the project
- Sample miniature barrel
- Sample budget from example construction project and template
- Sample time-line and progress report

Background References or Related Web Sites

Handbook for ROV Pilot/Technicians; Bell, Bayliss, and Warburton; Oilfield Publications Limited; ISBN: 1 870945 67 0

Monterey Bay Aquarium Research Institute (MBARI) - they have two state-of-art ROV's
www.mbari.org

Deep Ocean Engineering - builder of Phantom ROV's
www.deepocean.com

MATE Summer Weblinks

Time Required

3 hours

Procedure

- Introduce ideas by lecture
- Promote student discussion
- Develop task-oriented student teams
- Teams will plan future courses of action

Discussion Questions

1. What are the budget factors to be considered?
2. What are the time constraints to be considered?
3. What are the safety factors to be considered?
4. How are the teams going to negotiate and resolve issues?
5. What is the next course of action?

Assessment Strategy

1. Students will describe initial budgetary considerations.
2. Students will list three resources for technical information.
3. Students will divide into task-oriented teams.
4. Students will develop a preliminary time-line to complete the project.
5. Students will articulate the task for the ROV.
6. Students will identify the preliminary subsystems of the ROV.
7. Students will demonstrate that they have coordinated their efforts.

Lesson Extensions

- Execute