



## SENIOR DESIGN ORGANIZATION SYNOPSIS – SPRING 2013

### REMOTELY OPERATED UNDERWATER VEHICLE (ROV)

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Remotely operated underwater vehicles (ROVs) are remote control underwater robots driven by an individual on the surface. They are tethered by a series of wires that send signals between the operator and the ROV. All are equipped with a video camera, and most of the time lights. Other equipment is added depending on the specifications required. These include a manipulator arm, water sampler, instruments that measure clarity, light penetration, temperature, and depth.

The purpose of this project is to design and build an ROV to be entered in the Marine Advanced Technology Education (MATE) ROV competition on June 20-22-2014. This competition is divided into 3 categories, and we will be entered into the explorer category which is the most advanced. Our group is currently researching design criteria and material selection. We are taking the various requirements of the competition into consideration to design the most efficient ROV for the tasks at hand.

The ROV will be following the criteria established by the Marine Advanced Technological Education (MATE) Competition. It must complete a number of tasks within a certain time frame divided in the following way:

- I. 5 minutes to set up system and begin submerging.
- II. 15 minutes to complete tasks:
  - Task #1: Complete a primary node and install a secondary node on the seafloor.
  - Task #2: Design, construct, and install a transmissometer to measure turbidity over time.
  - Task #3: Replace an Acoustic Doppler Current Profiler on a mid-water platform.
  - Task #4: Remove bio-fouling from structures within the observatory.
- III. 5 minutes to demobilize the system.

We expect that the ROV not only will accomplish the tasks given by the competition, but also be able to carry out multiple other tasks. Another important goal is to produce an efficient ROV at a fraction of the cost of a commercially available one. That way a recreational boater or student may have access to one to explore and get involved with the marine life.