Navy Recruiting District, Denver’s SeaPerch Challenge will be March 11, 2017 at University of Colorado student recreation center, located on the west side of the Folsom Field (just off the northwest corner of the stadium) on the main campus in Boulder. Two top teams from this regional competition will qualify to compete in the 2017 SeaPerch National Challenge at Georgia Tech in Atlanta, GA on May 19-20 at their own expense.

All code of conduct and release and waiver of liability forms need to be completed and signed by each team member and turned in at check-in.  Check-in time for teams is 8:00 to 8:45 am, opening remarks and safety brief will be at 9:00, competition begins at 10:00, and our awards / closing ceremony will be at 1:00 pm.  Attached are the updated Engineering Notebook Guide and Engineering Rubric for your review.  Please have your team email me their   Engineering Notebook as a PDF file by next Wednesday, March 11 (tim.askew@navy.mil).  During the competition, teams will display their notebook at their team table.  The notebook can be in paper notebook form or on a computer/iPad or similar device.  Your parking options at CU are: Lot 391 is $1.00 per hour, lot 380 is $4.00 for all day, or lot 169 (dirt lot on the far side of Boulder creek) is free.

We will be running one competition, the stock high school class (see the SeaPerch website for full details, www.seaperch.org)

**Stock Class (High School)**

* Teams may utilize materials (quantity and components) equivalent to one SeaPerch kit.
* Teams have a budget of $20.00 in addition
  + It is the actual value of the modifications that must be $20 or less.
  + Donated material will be assessed at what the cost would be to procure the material.
  + The $20 limit is for cost of the materials utilized on the final competition vehicle.
  + Reasonable spare parts (one set of thrusters (3) and one controller) are not included in this budget.
  + Proof of budget compliance should be made available to the judges upon request.
* 3D printed parts will be costed out at $0.05 per gram.
* All motors must be waterproofed.
* Hooks and attachments MAY NOT be added/removed between competition rounds.
* Additional NON-stock motors may be utilized for actuation or other non-propulsion uses.
* Teams may only utilize stock SeaPerch motors for propulsion (Jameco Electronics P/N 232022).
* Teams may only utilize three (3) thrusters.
  + A thruster is defined as a means of propulsion for the SeaPerch, normally but not limited to a motor and propeller assembly.
* Teams will design for and utilize a 12-volt power source.
  + Power source other than the included kit battery or venue supplied power is not permitted.
* ROV thruster controls shall use simple switches only, no power conditioning or pulse-width modulation (PWM) controls are allowed in Stock Class.  Use of a fixed or variable resistor to reduce voltage is acceptable.
* ROVs shall fit thru an 18" hoop.

This year there will be two underwater courses, the Obstacle Course and the Challenge Course.

OBTACLE COURSE -

For the Obstacle Course teams will be required to traverse through five rings, surface and return through the five rings. All Rings must be traversed in both directions. Fastest elapsed time wins.

1. Only two team members are allowed on the pool deck during the competition.

2. The rings shall be traversed in order, closest to the wall first.

3. The ROVs must move only under their own power. It is prohibited for a team member to pull the

Vehicle by the tether. This action will incur a 2 minute penalty per occurrence.

CHALLENGE COURSE –

The challenge consists of an 'Origin' where 3 rings and 3 cubes will be located within a fixture.  Each of these objects will need to be transported to the 'Platform' for differing amounts of points.

Scoring: Maximum number of points in the shortest amount of time.  The clock stops when the team identifies they are done, surfaces and touches the wall with the vehicle.  Teams may stop the clock at any time, but it will not be restarted. Teams must inform the judges at the time if they wish to stop the clock and lock.

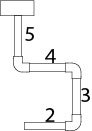
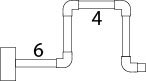
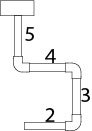
### Scoring

Rings:

Rings can be placed on the platform for 1 point

Rings can be placed on the upper spikes for 2 points

Rings can be put on the Zig-Zags for the following points:

-only one ring scores per Zig-Zag

-Rings on fittings score the lower of the point options

Cubes:

Cubes can be placed on the platform for 1 point (stacking gains an additional point)

Cubes can be put on the upper spikes for 2 points

Cubes hung in the Zig-Zags double the ring points (no ring no points)

in their scoring.

ENGINEERING NOTEBOOK

In order to more closely align with the engineering aspects of the SeaPerch National Challenge the Poster competition has been replaced by the Engineering Notebook challenge.

Using an Engineering Notebook provides a good learning experience and documents the team’s knowledge, skill, and effort.

The Engineering Notebook is used to measure the team’s ability to document the engineering design process used to design and modify their SeaPerch to meet the pool challenges. The Engineering Notebook is not intended to document the construction of the standard SeaPerch ROV.

Each team will submit their Engineering Notebook online as a PDF file.

The SeaPerch Engineering Notebook can be:

1. A physical notebook that is scanned or photographed and assembled into a single PDF file for online submission.
2. An electronic document created with Google Docs, Google Slides, Microsoft Word, Microsoft PowerPoint, or any other program that can save or print to the Portable Document Format (PDF).

Required Content, Format, and Limitations:

The SeaPerch Engineering Notebook should include:

      I.        Front matter

1. Cover/Title Page
   1. Project Title (be creative)
   2. Team name
2. Team Information Page
   1. School or club name
   2. School district (if applicable)
   3. City and State
   4. Name and email address of teachers, coaches, mentors, advisors
   5. Team member names and role in project
3. Table of Contents Page
   1. List page description and page numbers

     II.        Engineering Design Process

1. Provide details of each step taken in the engineering design process stating the SeaPerch Challenge pool events as the project problem/goal.
2. Provide sketches, drawings, charts, and other graphics and written documentation describing solution and design concepts, design iterations, tests performed, and test results.
3. Include engineering and scientific terms and concepts to demonstrate that the team understands the challenges of constructing and operating an underwater ROV.
4. All pages should be numbered and listed in the Table of Contents.

Format and Limitations

1. Must be submitted online in PDF format.
2. Must be no more than 4MB in size.
3. Must be formatted as 8-1/2” x 11” pages.
4. Must be no more than 20 pages including the title, information, and table of content pages