



# MARYLAND REGIONAL SEAPERCH CHALLENGE

For Middle/High Schools

April 6, 2024

United States Naval Academy

Hosted by the United States Naval Academy,

Sponsored by the Office of Naval Research

Please join us for the SeaPerch ROV Challenge at USNA. Teams will build their kits and come together for Sea Trials with teams from across the region.

REGISTRATION BEGINS 8am – you must pre-register by March 8 online at

<http://www.usna.edu/stem>

Additional info on schedule and logistics will be provided by email.

## PRELIMINARY COMPETITION 9am-12pm

TEAMS WILL BE EVALUATED ON THE FOLLOWING:

- **DESIGN, CONCEPTS AND TEAMWORK** – teams will be asked a series of questions to determine the level of effort and understanding in these areas.
- **CREATIVITY AND ENGINEERING APPLICATIONS** - SeaPerch will be judged on aesthetics, robustness, creativity of modifications to accomplish mission.
- **BASIC LAUNCH**
  - **Speed** Average of time for 2 trials for a standard distance.
  - **Maneuverability** Speed to complete a submerged obstacle course that involves large rings (22" minimum diameter), oriented in any direction, through which the vehicles must travel. A possible course includes three 22" diameter hoops.
  - **Ring Challenge** Retrieve weighted underwater ring, time stops when ring is delivered to surface at tank wall.

This competition is for STOCK CLASS only, as described in Competition Classes Overview at [seaperch.org](http://seaperch.org). Challenge components and rules may be modified and will be announced at the event.

There is NO poster, formal presentation session, nor design notebook required. Neither technical reports nor "Meet The Team" will be reviewed or required, however: Please note SOME of these items, including technical report and "Meet The Team", ARE required for the International Competition for qualifying teams. See <https://seaperch.org/programs/2024-season/> for details.

## General Rules and Information

- Only team members are allowed in the test lanes during competition.
- All team members must wear closed toe shoes with rubber soles.
- Nothing other than the SeaPerch ROV may be put into the tanks.
- Each SeaPerch ROV will perform a dry compliance check during the qualifying round and be inspected by an official prior to competition.
- There will be a triage area for repairs.
- Teams have a budget of \$25.00 to modify the SeaPerch. It is the actual value of the modifications that must be \$25 or less. Donated material will be assessed at what the cost would be to procure the material. The \$25 limit is for costs of the materials utilized on the final competition vehicle. Reasonable spare parts are not included in this budget. 3D printed parts will be costed out at \$0.05 per gram. Proof of budget compliance should be made available upon request.
- ATTACHMENTS ONLY may be 3D printed; ROVs must be 'stock class' PVC pipe/CPVC, or PEX.
- Hooks and attachments MAY NOT be added/removed depending on the competition round.

- Adjustments to buoyancy can be made during competition but timer will not be paused.
- Additional motors may be utilized for actuation or other non-propulsion uses.
- Teams may only utilize stock SeaPerch motors in thruster. Teams may not add additional thrusters to the SeaPerch. A thruster is defined as a means of propulsion for the SeaPerch, normally but not limited to a motor and propeller assembly.
- ROV thruster controls shall use simple switches only, no power conditioning or pulse-width modulation (PWM) controls are allowed. Use of a fixed or variable resistor to reduce voltage is acceptable.
- All motors must be waterproofed.
- Teams will design for and utilize the 12-volt battery as provided in the SeaPerch kit. Overcharging or stacking batteries is not allowed. Be sure to have your 12V battery fully charged and with you. Batteries will not be provided except in emergencies.
- Teams may work on the vehicle during the competition, but the clock will continue to run.
- The vehicle cannot be dragged via the tether.

### **FINAL COMPETITION**

Based on results of preliminary rounds, finalists will progress to the final round. The final challenge will be similar to but not necessarily the exact replica of the one described under Pool Courses Mission Course for the 2024 SeaPerch International Competition at <https://seaperch.org/programs/2024-season/>.

Challenge components and rules may be modified and will be announced at the event.