On the Water Challenges

All Challenges can be done in Full-Autonomous or Semi-Autonomous (manual control of Rudder) modes.   Semi-autonomous mode is easier and is very useful when learning to code and learning how the boat behaves.

Basic Maneuvers that need only a Wind direction sensor:

1. **Tack turn:**
   Sail on a Close Haul or Close Reach, turn bow 90° through wind, then continue on a Close Haul or Close Reach

2. **Jibe turn: stern 90° through wind**
   Sail on a Broad Reach, turn stern through wind, then continue on a Broad Reach

3. **Get out of irons**
   Start boat in irons. Get out of irons within a given amount of time, continue on given point of sail

4. **Head up to a given point of sail**
   Start boat at some point of sail, head up to a given point of sail within a given amount of time, and continue on that course

5. **Bear Off to a given point of sail**
   Start boat at some point of sail, bear off to a given point of sail within a given amount of time, and continue on that course

6. **Tacking > 90° (side to side course)**
   Start boat at some point of sail, change course to a beam reach, tack around to the other beam reach, and continue as such.

7. **Beating-upwind course** –
   Starting behind a "line", sail upwind to cross another line approx. 30m upwind.
   Finish position should be with +-15 meters side to side

8. **Run-downwind course** –
   Starting behind a "line", sail downwind to cross another line approx. 30m upwind. Include at least 1 jibe
   Finish position should be with +-15 meters side to side

9. **Sail a 20 meter circle/diamond**
   Complete a course where you finish within 3 meters of your start position. Sail out in a circle/diamond pattern with at least 1 tack and 1 jibe. May be sailed full or partial autonomous

10. **CBI Helmsman Test**
    Boats will sail a course similar to the course that CBI Adult and Junior members sail to earn their Helmsman/Yellow Rating. The course includes 3 buoys in a windward-leeward line, spaced approximately 10 meters apart. Boats start below the leeward mark and sail upwind performing 3 tacks around the buoys, round the windward mark and sail downwind performing 3 jibes around the buoys and finishing below the leeward mark.
    If a boat needs to switch to manual control they must return to the start to sail the course again for full-autonomous points.
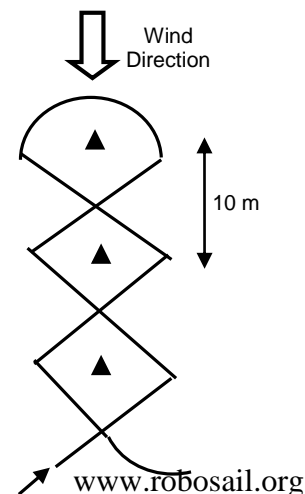
On the Water Challenges

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Advanced Maneuvers

Maneuvers that need a Wind direction sensor and a Compass

11. Sail at compass angle
   Start sailing at a given heading from a starting point. Make one course change to the desired compass angle (desired angle will not be in the no-go range and no tack or jibe required)

12. Sail at compass angle with tack/jibe
   Start sailing at a given heading from a starting point. Make one course change to the desired compass angle (desired angle will not be in the no-go range, 1 tack or jibe required)**.**

Maneuvers that require at least a Wind direction sensor, a Compass, and GPS

13. **Station keeping course** –
   Boats will sail into a 20 m x 20 m "box" formed by four buoys with known GPS locations. The boats should to remain in the box for a given amount of time, then exit the box.

14. Sail through Finish Line
   Sail through a finish line determined by GPS coordinates from a given starting position that is approximately 20 meters away.

15. Sail to WayPoint
   Sail to within 3 meters of a waypoint from a given starting position that is approximately 20 meters away.