ENGEN180 Project Rules 2021

* Each Syndicate must design and construct a boat capable of collecting floating plastic waste from the university lake and returning it to shore. These MUST be ‘ready-to-race’ in the week prior to competition day – there will be no provision for last minute finishing or running repairs.
* Failure to follow the rules outlined here may result in disqualification from the competition.
* The judge’s word is final.

**Boat Specifications**

**Dimensions**

1. The boat (and any attachments) will have to be storable in a space 700mm x 450mm x 480mm (LxBxH), attachments must be easily removable or collapsible for storage.

**Hull & Deck**

1. Boat hulls must be fashioned from clear plastic (PETG). The hull and deck must be glued together (around the entire edge), and the water tight compartment fully contained within a hull. When joining multiple hulls together they must form a rigid structure.
2. The deck (or decks of each hull) must be from a single piece of TPS. Decks must be flat with the water tight compartment formed from the same sheet (i.e. the deck and the water tight compartment is one piece).

**Hatches and Water Tight Compartments**

1. Hatch covers must provide full access to the internal workings.
2. Water tight compartments cannot have a ‘partial’ hatch with the other part permanently glued in place. Hatch covers must be sealed with water proof tape during operation (there must be 10mm of clear area i.e. no screws/obstructions or paint around the hatch).
3. The receiver and all water sensitive components (refer to price list) must be sealed in a waterproof compartment(s) when on the water.

* Compartments must be moulded using the pre-prepared shapes available in the lab (will be available for inspection/measuring during the labs).
* Water tight compartments must have **the base plate** (prefer to price list) fitted correctly to create a sump at the bottom of the compartment. Any water sensitive components must sit on or above the base plate and not block the drainage holes at the corners of the base plate.
* Servo(s) and control gear must be in the SAME compartment.
* The receiver (and its associated battery pack) and all leased items must be installed without adhesives and in such a way that they are easily removed without cutting away any part of the boat to gain access.
* Servos must be screwed, not bolted (i.e. nuts may not be used to secure the servo in place), into a mount fixed to the base plate.

1. The single-sided tape is only for sealing hatches (i.e. cannot be used as a general construction material).

**Electrical**

1. All electrical connections must use crimp connectors or terminal blocks – no twisting wires together.
2. Boats must have some form of switch to turn the motor of/on – this cannot be simply twisting wires together.
3. Boats must have the ability to reverse while competing (i.e. will need some form remote controlled reversal of voltage to the motor).
4. Batteries will be provided to syndicates free of charge. Each syndicate will receive the amount of batteries they have designed for (i.e. the number of batteries that fit into the battery packs contained in their hull during normal operation of the boat, batteries for ‘spare’ battery packs will not be provided).

**Constraints**

1. Each syndicate has a $165 credit at Brett’s Bargain Basement (BBB), for procuring the materials and components to build their boat. This excludes the Receiver & Transmitter (R/C gear) and batteries which will be provided for free. Transmitters must be returned to BBB at the end of each lab session and at the end of each race on race day. Syndicates are responsible for the care of their receiver units as no replacements will be available. No other materials may be used other than what is listed in BBB’s 2020 price list.
2. Only the R/C gear provided by BBB may be used.
3. You are only permitted to use scheduled Lab periods to work on the boats (i.e. no part of the boat shall be taken home, you cannot use the lab outside your scheduled lab time).
4. Only the tools provided for the ENGEN180 course may be used to fabricate the boats.

**Lab conduct**

1. A syndicate may buy materials from BBB by submitting an order form (terms and conditions apply as stated on the order form)
2. All syndicate members must be involved. Syndicate managers may not participate in any “hands on activities”.

**Penalties**

1. If a syndicate member is found to break any of the 4 basic rules of tool safety, then the whole syndicate will be given an immediate 10 min stop work order.
2. Infraction of other rules will result in a points penalty levied on race day.
3. If a boat is deemed not to be water tight and/or buoyant, or judged incapable of effective navigation or reverse, it will not be allowed to race.
4. Modification of leased items will result in confiscation of the item without recompense.