



# Institute of Computer Engineers of the Philippines

SEC Reg. No. 201120675

## Name of Event: Line Follower and SumoBot

*(Note: This guideline is intended for the National CpE Challenge. If the same will be used for Regional Competitions, necessary changes may do, if applicable).*

**Objective:** Build an autonomous robot capable of traversing a black line on a white background, without losing the line. The robot to complete the course in the shortest period of time while accurately tracking the course line from start to finish wins.

### THE COMPETING TEAM

1. Each participating region is entitled to send one team (the regional team's champion) composed of three (3) ICpEP student members regardless of year level endorsed by the ICpEP Regional Chapter President. Regions with twenty or more schools offering BSCpE program may send maximum of two (2) teams.
2. A registration fee of Php 1,500.00 per team shall be collected.
3. All team members must be currently enrolled in BSCpE program during the time competition.
4. The region assigns a faculty member who shall serve as coach. The coach is also the team's official representative and only authorized person to file a protest in behalf of the team.
5. List of participants (form provided on the last page) must be sent through email, [dion\\_tand@yahoo.com](mailto:dion_tand@yahoo.com), on or before **November 10, 2018** (for National Competition only). Late submission of entries shall not be accepted.

### THE BOARD OF JUDGES (BOJ) AND REFEREES

The BOJ shall be composed of three (3) representatives/staff from Hytech Power, Inc. (HPI). They will also serve as referees during the competition proper and shall convene to resolve any issue that may arise during the conduct of the competition.

### REQUIREMENT FOR ROBOTS:

1. Size and Weight Limits. Maximum size of a robot is **W:25cm x L:25 cm**, the **height is unlimited** and the maximum **weight is 3 kg**. Dimensional and weight limits for robot shall be strictly enforced. Robots must have passed inspection by BOJ prior to competing.
2. Batteries. The maximum voltage to be used for the robot is 24 V. Recommended battery is energizer.
3. The robot must have a start and stop button or a remote control.
4. Requirements for Line Follower robot. The robot can be built out of Roborobo kit of HPI or may opt to use **ANY line follower robot kit materials**. All competing robots must be built prior to the competition proper.

### GAME RULES AND REGULATIONS:

#### Registration and Quarantine:

1. All participants must be at the designated competition venue (University of the Cordilleras – Theater) before 8:00am for registration and inspection of the **built robot**.
2. Each team will be given the maximum of 60 minutes to program and test their robot to the actual challenge field.
3. Only one set of robot is allowed per competing team. The use of plastics, paper or other soft materials are allowed but is limited to 5% of the robot.

4. Only the student participants are allowed in the competition area. There will be a designated area for all the coaches to sit/stay. Coaches are prohibited to help the students at the competition area during the competition proper.
5. The robot must be fully autonomous and should not be dangerous or excessively annoying.
6. All competing robots will be placed and displayed in the quarantine area after registration and inspection. No modifications are allowed after the robots have been surrendered/submitted.

#### **Game Proper:**

1. A competing robot must be placed at the starting area while waiting for the BOJ's signal to start the challenge.
2. The timer starts once the robot has started to cross the starting line. Time is measured from crossing the start line until the robot crosses the finish line. A robot is deemed to have crossed the finish line when the forward most part of the robot contacts or crosses over the line.
3. A maximum of 3 minutes is allowed for a robot to complete the course. A robot that cannot complete the course in the allotted time shall be eliminated for that round. Time is measured and monitored by the BOJ using a stopwatch.
4. A robot that wanders off of the field track area (arena) will be eliminated for that round. A robot is deemed to have left the field track area when any wheel or leg has moved completely off the field track arena.
5. Robot will also be eliminated from that round if it does not trace the line within 10 seconds after deviating from the path. Robot that loses the line course must reacquire the line at the point where it was lost, or at any earlier (e.g. already traversed) point.
7. Each team will have two (2) rounds of run during the competition. The first run allows the competing team to complete the course. After the team's first run, maintenance to the robot (e.g. battery replacement, reprogramming of the code, parts replacement, etc.) is allowed for a maximum of 15 minutes. The robot must be placed back to the quarantine area after the maintenance time, otherwise, the team is disqualified from the competition.
8. Once the last team has finished its first run, the second round of run begins after the maintenance time.
9. The shortest time recorded for each team for the two runs will be the final betting time for that team. In cases that the team's first run is eliminated and the second run completed the course, only the time recorded in the second run will be considered. If both runs are eliminated, the team is disqualified from the competition.
10. The decisions of BOJ regarding these rules and the conduct of the event shall be final. No objections shall be declared against the BOJs' decisions. The coach of a team can present objections to the BOJ before the match is over, if there are any doubts in the exercise of these rules.

#### **Challenge Field Specifications:**

The line following field track area or arena is **122cm wide x 305cm long**. It consists of a black line in a white background. The black line shall be **20 mm wide**. There shall be a starting line area at the beginning of the course and the finish line area at the end.

Characteristics of the black line:

- a. There shall be no crossovers (e.g. places where the line crosses itself)
- b. Switchbacks and hairpins are possible, but the adjacent sections of the line shall be no closer together than 15cm when measured from the center of each line.
- c. The closest approach of the line course to the edges of the arena shall be no less than 15cm, measured from the center of the line.
- d. The minimal curve radius is 7.5 cm.
- e. Sharp angles may occur, but will not be smaller than 90°

## Liability

Participating teams are always responsible for the safety of their robots and are liable for any accidents caused by their team members or their robots. The ICpEP and the organizing team members will never be held responsible nor liable for any incidents and/or accidents caused by participating teams or their equipment.

## Sample Challenge Field Track

