LINE TRACER

I. Description

This is a mission where a wheel-driven robot uses sensors to move along a black line. It is also a game where the robot crosses the finish line to determine the winner. The fastest robot is the winner.

II. Rules

1. General Rules

1.1. A team consists of 2 students and 1 instructor, except for international participants.

1.2. Each student can participate in a maximum of TWO CATEGORIES.

1.3. **SHARING** robots with other teams is **STRICTLY PROHIBITED.**

1.4. All rules and regulations are subject to change without prior notice.

2. Competition Categories

CATEGORY	TOOL	AGE
Junior	SPIKE & EV3	7 – 12 years
Senior	SPIKE & EV3	13 – 18 years
Open Resource	No limitation	7 – 18 years

3. Robot Restrictions

3.1 Sensor Limitations

ROBOT	SENSOR LIMITATIONS
EV3	Up to 4 sensors, must be from the 45544 set
SPIKE PRIME	Unlimited sensors, must be from the 45678 set
OPEN RESOURCE	No sensor limitations

3.2 The robot must use only one controller (or hub).

3.3 The robot may use up to four motors.

3.4 The weight of the robot is unlimited.

3.5 The size of the robot is limited to 25x25x25 cm.

4. Special Rules for EV3 and Spike Prime Robots

4.1 Only motors from sets 45544 and 45678 are allowed in this category.

4.2 Robots must use components provided by Lego.

4.3 Components must not be glued or joined using any adhesive.

4.4 Original Lego parts must not be modified.

4.5 Power sources must not be altered.

4.6 The judges will make decisions in various aspects.

III. How to play

1. General Rules

1.1 Robots must be pre-assembled.

1.2 Pre-programming is allowed, but participants can also program and adjust robots during practice time.

1.3 Robots must operate autonomously and complete tasks independently. Any form of wireless communication, remote control, or wired control is prohibited while the robot is running.

1.4 There are three rounds. The ranking will be determined based on the best performance along with the fastest time of the participants from the three rounds.

1.5 Any changes or additions to the game format will be explained during the briefing for mentors and judges.

2. Track

2.1 The map's dimensions are 2400 mm x 1200 mm.

2.2 The map is printed on durable material with a thickness of 2 mm.

2.3 The black line width is ±20 mm.

2.4 The black line shape will be announced later.

3. The Race

3.1 The black line must remain between the robot's moving parts.

3.2 If the robot's controller (both wheels) crosses the black line, it is considered off the track.

3.3 The game will stop if an off-track situation occurs in line-tracing events.

3.4 On the competition arena, the organizers will place task blocks within the Danger Zone. Each team's mission is to completely push the task blocks out of the Danger Zone. The organizers will set markers for the robots to identify the positions of the task blocks and the Danger Zone. The positions of the task blocks and the Danger Zone will be announced by the organizers on the morning of the first competition day.

3.5 The size of the task blocks is limited to 3cm x 3cm x 10cm.

3.6 Each task block is worth 1 point. There will be a maximum of 3 task blocks.

3.7 When the robot completes the race, it will receive 3 points.

3.8 Performance Points = Task Block Points + Race Completion Points.

The ranking will be determined based on Performance Points. If teams have the same Performance Points, the ranking will be decided based on the time criteria.

3.9 If a robot fails to complete the race, its race completion time will DEFAULT to 120 seconds.

4. Timing

4.1 Pay close attention to the “Ready-Go” signal from the judges and move the robot.

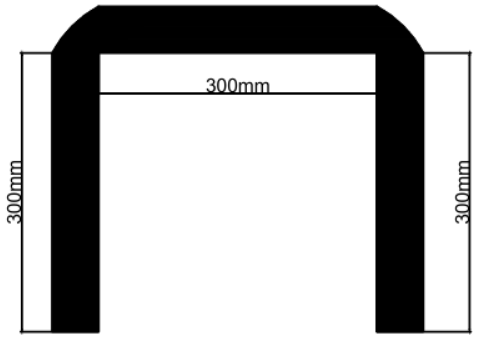
4.2 Timing starts when the robot crosses the measuring device.

4.2 The measuring gate's dimensions are 30x30x30 cm.

4.3 The robot must be re-run if the measuring device is accidentally interrupted. However, intentional interference may lead to disqualification, based on the judges' decision.

4.4 Participants are required to observe the robot as it moves.

4.5 The line-tracing map will be revealed on the competition day.



The measuring gate's dimensions

IV. Example of map