Brought to You By

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UNIKL MFI ROBOT LINE FOLLOWER COMPETITION 2019

RULES AND REGULATIONS (VERSION 4)

UniKL UNIVERSITI KUALA LUMPUR

ROBOTIQUE SOCIETY
ROBOTIC ENGINEERING COMMUNITY

AUTOMOTIVE ENGINEERING SOCIETY

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1. OBJECTIVE

Participants are required to build a line following robot/car that can follow the black line and complete the track within the time limit according to the competition rules. The robot must be operated autonomously.

2. ROBOT SPECIFICATION

2.1. Dimension and weight

2.1.1. For Lower School Category, the size of the robot must not exceed 25cm (length) x 25cm (width) x 30cm (height).

2.1.2. As for High School and Open Category, robot dimension should not be exceeding 20cm (length) x 20cm(width) x 30cm (height).

2.1.3. The weight of the robot shall not exceed 3kg.

2.2. Robot restriction

2.2.1. Any wireless/wired remote control is **PROHIBITED**

2.2.2. The design of the robot shall not damage the field deliberately.

2.2.3. The robot shall not exceed the dimension as stated in 2.1. The team will be disqualified if their robot exceeds the dimension

2.2.4. Robot (with same attribute) that already registered to participate in particular category shall not be used in another category.

3. RULES AND REGULATIONS

3.1. Game rules

3.1.1. Each team may/shall consist of NOT more than TWO (2) players only.

3.1.2. Only one person from the team can enter the field area.

3.1.3. Team must be at the field area after had been called. FAIL to do so after 3 times call, the team will be disqualified.

3.1.4. The robot should start at designated position.

3.1.5. Once it has crossed the “gate”, the timer will start and would stop when the robot crossed the second gate at the end of the track.

3.1.6. Each part of track will have its own checkpoint marked.

3.1.7. Each checkpoint is marked with line.

3.1.8. Each team must overcome all checkpoint.

3.1.9. We shall inspect the robot. The robot must not have any major changes

3.1.10. Allowed changes:

3.1.10.1. Sensors

3.1.10.2. Batteries

3.1.10.3. Motors

3.1.10.4. Tires

3.1.10.5. Suspension system

3.2. **Game regulations**

3.2.1. Three (3) categories will be involved during this competition:

3.2.2. Lower School Category (Primary School)

3.2.3. High School Category (Lower and Upper Secondary School)

3.2.4. Open Category

3.2.5. Lower and High School category will have a maximum of three (3) minutes to complete the course while Open category will have a maximum of two (2) minutes to complete the course.

3.2.6. Participants will be given ONE (1) minute for trial run before the start of their game. Maximum of TWO (2) members may service their robot/car.

3.2.7. Reprogram the robot during the course run is allowed but the time will not be stopped.

3.2.8. Only replacement of identical parts and batteries are allowed during the servicing time. No extra components should be added after the robot inspection.

3.2.9. Time record of the robot finish each try after it passes the gate TWICE. (Start and Finish)

3.2.10. No limit on the number of retry. But the retry will be started from the starting line.

3.2.11. Retry is allowed but the time WILL NOT be reset. Each team also has option to restart at any checkpoint they have passed. No limit on the number of retry.

3.2.12. Robot vision are allowed.

4. CODE OF CONDUCT

4.1. Fair Play

4.1.1. Robots that cause deliberate interference with other robots or damage to the field will be disqualified.

4.1.2. Contestants that cause deliberate interference with robots or damage to the field will be disqualified.

4.1.3. It is expected that the aim of all teams is to play a fair and clean game.

4.2. Behavior

4.2.1. Contestants who misbehave may be asked to leave the competition area and risk being disqualified from the contest.

4.2.2. The rules will be enforced at the discretion of the referees, officials, and local law enforcement authorities.'

5. JURIES

5.1. All decisions about scoring, gameplay and timing are made by the juries. Teams should completely respect their vote and decisions.

5.2. Juries may discuss and announce new rules or decisions pertaining to any issues that are not mentioned in the rules and regulations. Objections will not be entertained.

6. GAME SCORING

6.1. Lower school category

6.1.1. Each team gets twenty (20) points after passing each checkpoint.

6.1.2. Game field will have TWO gate for start and finish.

6.1.3. The robot must start within the first checkpoint.

6.1.4. Once robot crosses the gate, timer will start and will not stop until robot crosses it at second gate.

6.1.5. Robot may begin retry at each checkpoint they have passed but the timer will not stop.

6.1.6. The robot shall not skip any checkpoints they have not passed.

6.1.7. There are three (3) checkpoints. A total of 100 marks shall be given upon completion.

6.2. High School Category

6.2.1. Each team gets twenty (20) points after passing each checkpoint.

6.2.2. Game field will have TWO gate for start and finish.

6.2.3. The robot must start within the first checkpoint.

6.2.4. Once robot crosses the gate, timer will start and will not stop until robot crosses it at second gate.

6.2.5. Robot may begin retry at each checkpoint they have passed but the timer will not stop.

6.2.6. The robot shall not skip any checkpoints they have not passed.

6.2.7. There are five (5) checkpoints. A total of 100 marks shall be given upon completion.

6.3. Open Category

6.3.1. Each team gets twenty (20) points after passing each checkpoint.

6.3.2. Game field will have TWO gate for start and finish.

6.3.3. The robot must start within the first checkpoint.

6.3.4. Once robot crosses the gate, timer will start and will not stop until robot crosses it at second gate.

6.3.5. Robot may begin retry at each checkpoint they have passed but the timer will not stop.

6.3.6. The robot shall not skip any checkpoints they have not passed.

6.3.7. There are five (4) checkpoints. A total of 100 marks shall be given upon completion.

7. GAME CHALLENGES FOR FIELD 1 (LOWER SCHOOL)

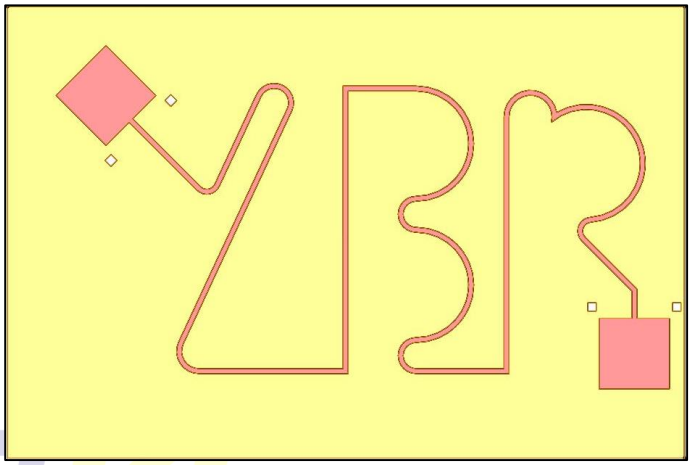


Figure 1 Lower School Field Top View

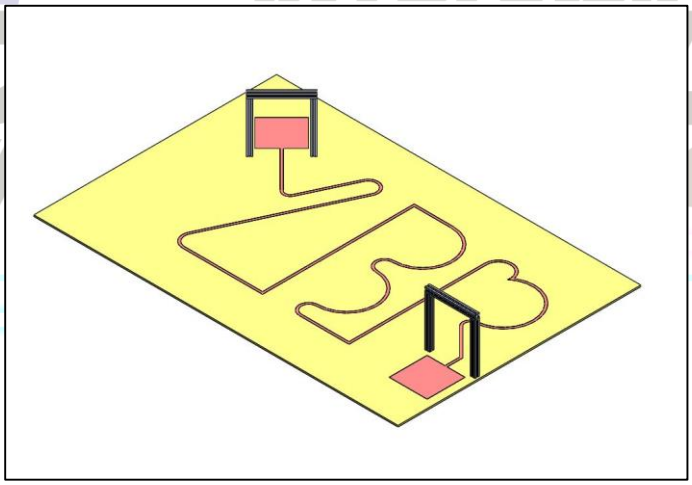
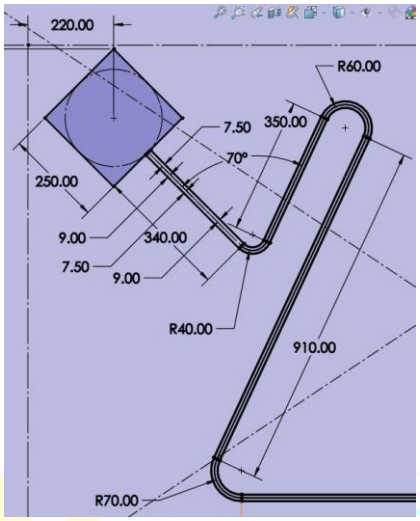


Figure 2 Lower School Field 3D View

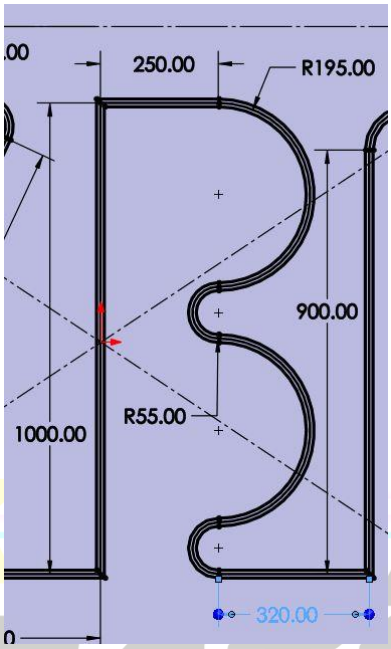
Primary checkpoint 1:

START



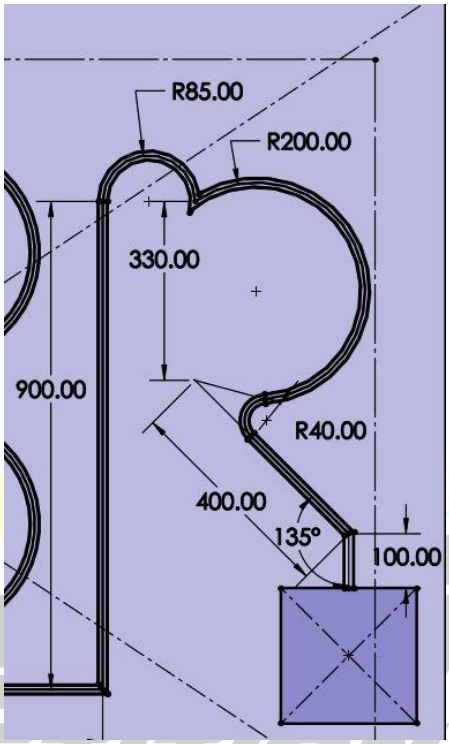
the robot will place in the square at the starting point. the square has 250 mm for the length. the first turn has a radius of 40.00(unit) for the radius. robot need to follow the line.

Primary School Checkpoint 2:



in checkpoint 2, there will be a sharp turn. the length for the straight line is 1000.00. after a sharp turn, there will be the first turn with the radius of 195.00(unit). second and third turn has 55.00(unit) for the radius. the robot need to follow the line.

Primary School Checkpoint 3:



third checkpoint start with a straight line with 900.00mm for the length. the first turn has radius of 85.00mm while, the second turn the radius will be 200.00mm. the radius for the third turn will be 40.00 mm. the robot will stop and finish after arrive in the square point.

For further detail upon game field, Kindly refer to the Adobe illustrator files that we posted on our official UIRC Webpage.
Map will be printed on canvas (2.4m x 1.6m) black and white. The line width will be 18mm.

8. GAME CHALLENGES FOR FIELD 2 (HIGH SCHOOL)

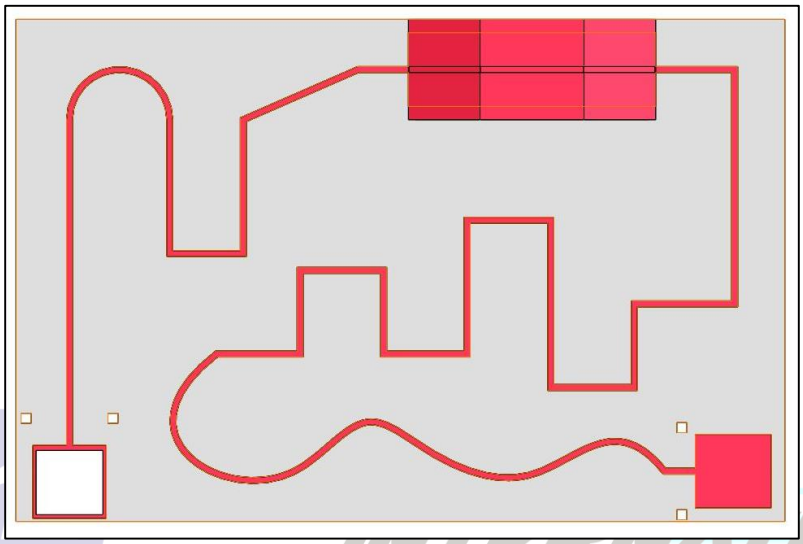


Figure 3 High School Field Top View

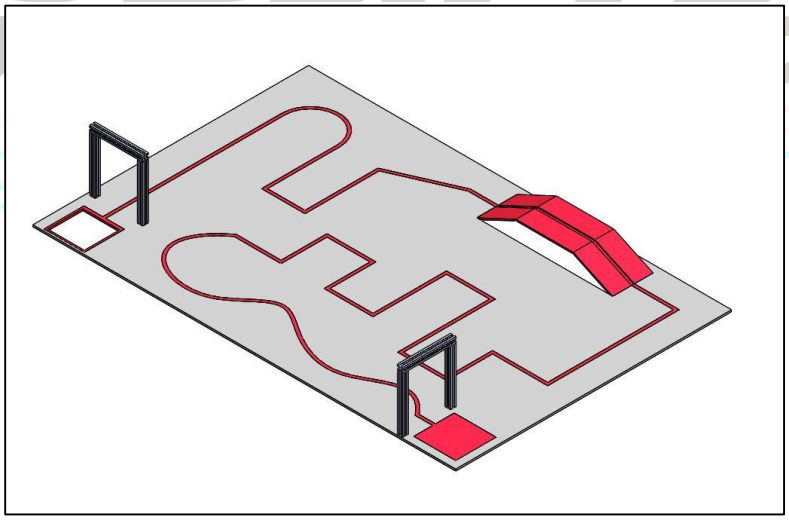
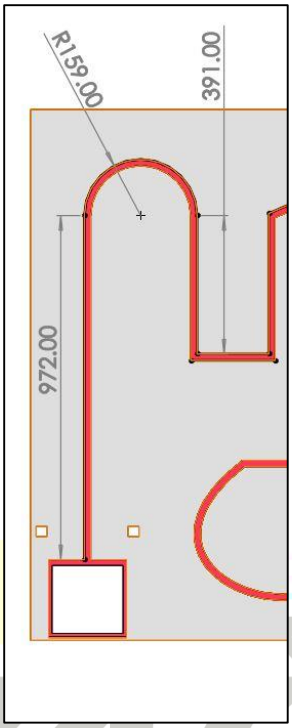


Figure 4 High School Field 3D View

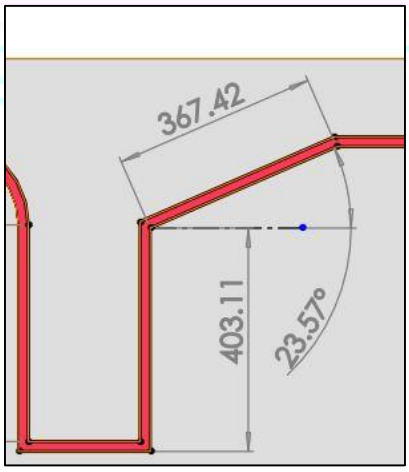


Checkpoint 1

- the robot will start with a 972.00mm straight line.

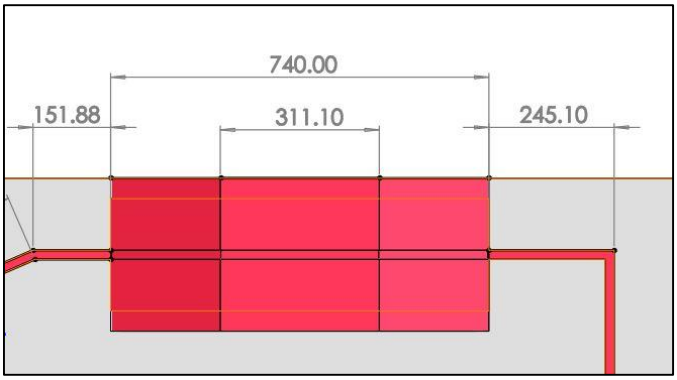
-the first turn has a radius of 159.00mm.

-the robot need to follow the line and passed all the turn



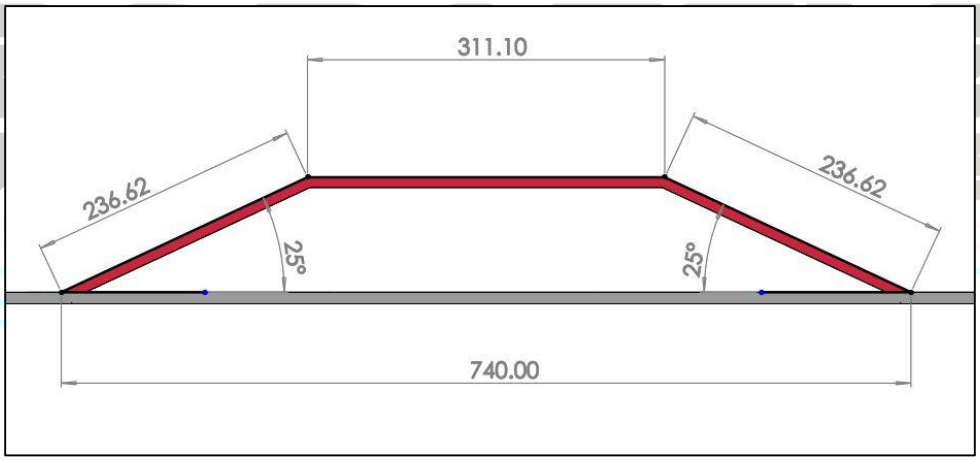
Checkpoint 2

-the robot must follow all the line and pass all the turn.



Checkpoint 3

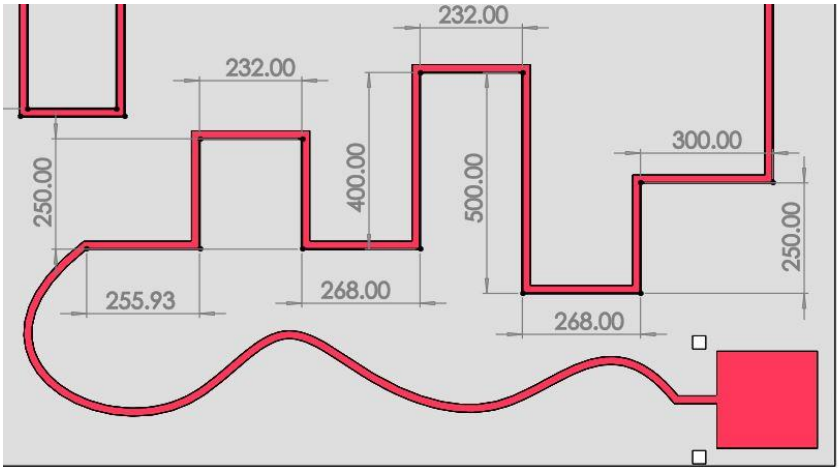
- the figure above shows the top view of checkpoint 3.
-there will be a ramp in checkpoint 3.
-first straight line has a length of 151.88mm.
-the length for the ramp is 740.00mm for the base while, the top of the ramp has 311.10mm for the length.



Checkpoint 3 side

the dimension of the ramp is stated as shown in figure above. the dimension is in millimeter.

Checkpoint 4



The robot must follow the line. the robot cannot cut or take a shortcut. the robot must stop inside the box. no part of the robot can be outside the box. the timer will stop once the robot passed through the second gate. all the dimension is stated in millimeter.

Checkpoint 5

Detail dimension, we will provide Adobe illustrator and Solidworks File.

please refer to the adobe illustrator file that provided in our official UIRC Webpage for more detail dimension.

Map will be printed on canvas (2.4m x 1.6m) black and white. The line width will be 18mm.

9. GAME CHALLENGES FOR FIELD 3 (OPEN CATEGORY)

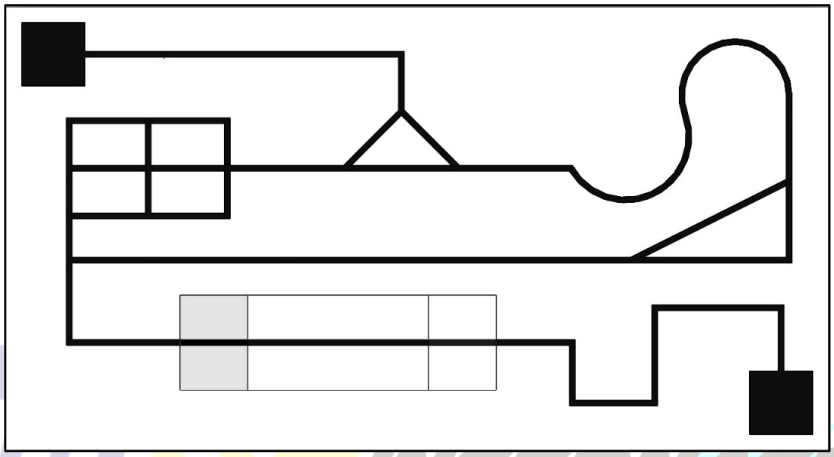


Figure 5 Open Field Top View

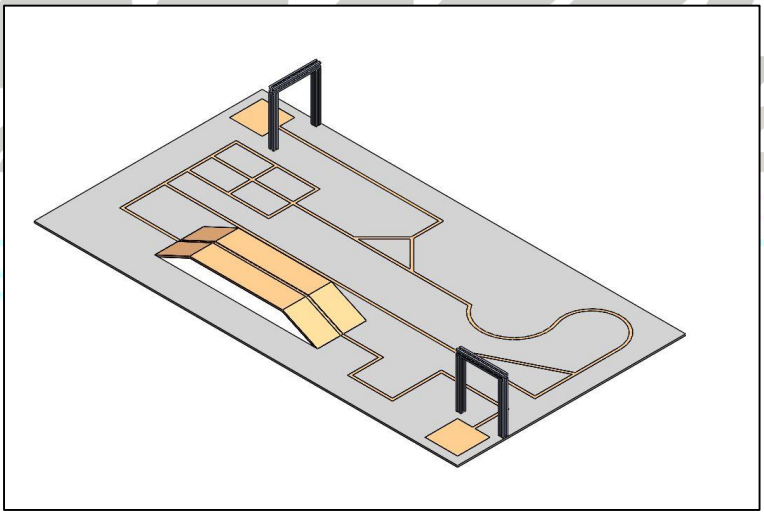
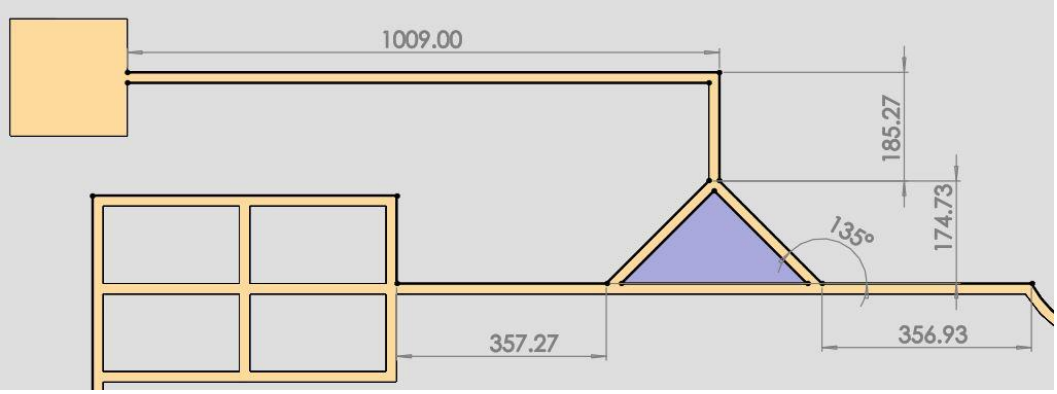


Figure 6 Open Field 3D View

Checkpoint 1:



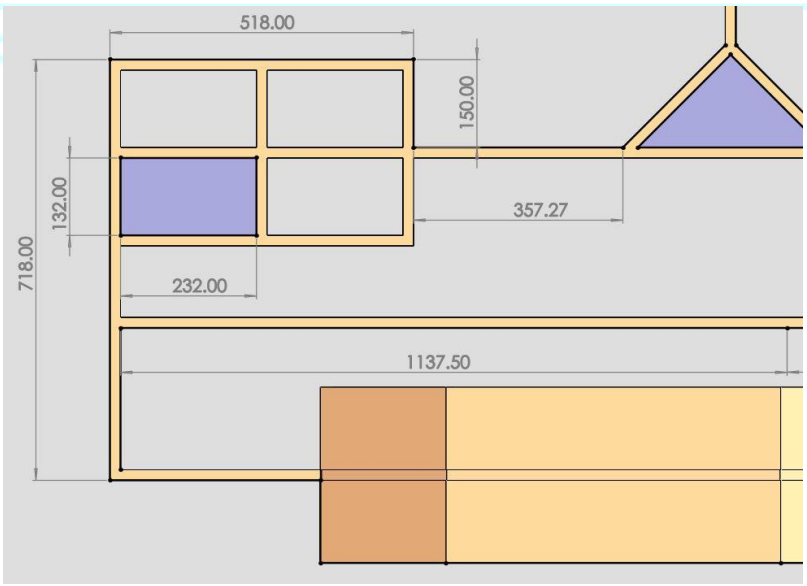
The robot will start inside the box. No part of the robot can be outside the box. the timer will start after the robot passed through the gate 1. The robot need to follow the line and cannot cut or take a shortcut. All the dimensions are in millimeter.

Checkpoint 2

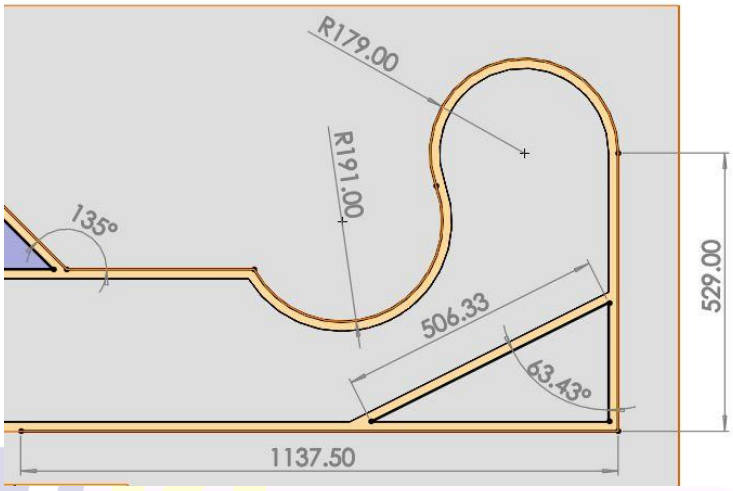
Checkpoint 2 consist of two different path which the robot must choose between two path after checkpoint 1.

Checkpoint 2a

At this check point, the robot has to pass through it by following any black line. All the dimensions are in millimeter.

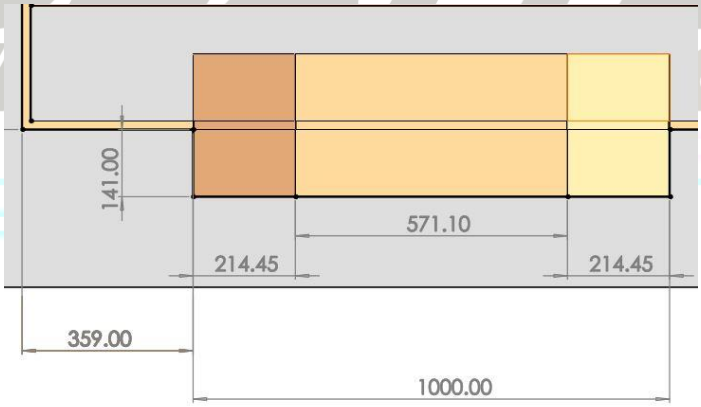


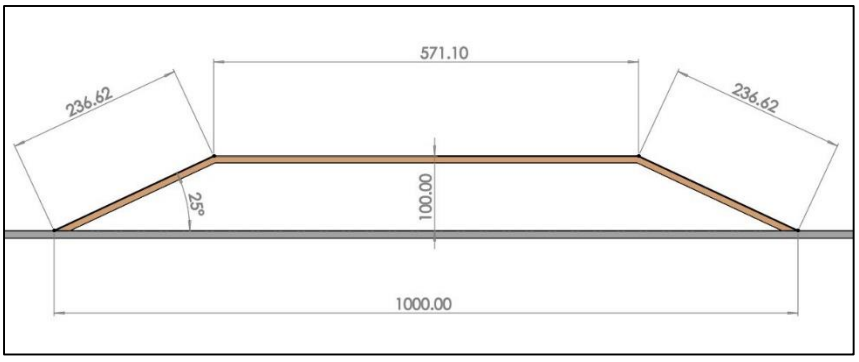
Checkpoint 2b



This checkpoint is the second path of checkpoint two. The robot must follow the line. the robot cannot cut or take a shortcut. The robot must stay and follow the line. the dimensions are in millimeter.

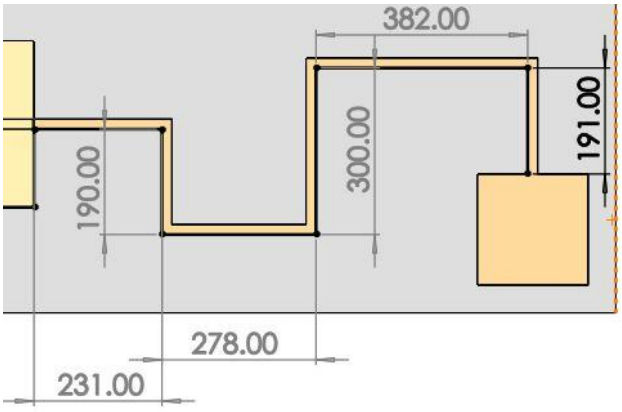
Checkpoint 3





At this checkpoint, the robot need to pass through the ramp. the robot must stay and follow the line. the dimensions are in millimeter.

Checkpoint 4



The robot must follow the line and cannot cut or take a shortcut. The robot must stop inside the box. No part of the robot can be outside the box. The timer will stop once the robot passed through the second gate. All the dimensions are stated in millimeter.

10. GAMEPLAY

10.1. No Elimination
10.2. Each team will be playing three (3) sessions per day.
10.3. The total points obtained will be accumulated.
10.4. Winners will be declared based on cumulative score
10.5. Winners will be announced during the prize giving ceremony.

11. REWARDS AND PRIZES

11.1. Primary School category

1st place prize - RM300

2nd place prize - RM200

3rd place prize - RM100

Best design - RM50

Best technology - RM50

11.2. Secondary school category

1st place prize - RM300

2nd place prize - RM200

3rd place prize - RM100

Best design - RM50

Best technology - RM50

11.3. Open category

1st place prize - RM300

2nd place prize - RM200

3rd place prize - RM100

Best design - RM50

Best technology - RM50

WHEN IN DOUBT, THE DECISION OF THE JUDGES ARE FINAL