UNIKL MFI ROBOT LINE FOLLOWER COMPETITION 2019

RULES AND REGULATIONS (VERSION 5)

Supported by:

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1. **OBJECTIVE**

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

2. **ROBOT SPECIFICATION**

   2.1. Dimension and weight

       2.1.1. For School Category, the size of the robot must not exceed **20cm (length) x 20cm (width) x 30cm (height).**

       2.1.2. As for Open Category, robot size must not exceed **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. Two (2) categories will be involved during this competition:

    3.2.2. School Category (Lower and Upper Secondary School)

    3.2.3. Open Category

    3.2.4. Both category have 2 stage of challenges.

    3.2.5. Both Open and School category will have a maximum of three (3) minutes to complete the course.

    3.2.6. Participants will be given ONE (1) minute for preparation 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.

    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. First Stage (School and open 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 the robot crosses the gate, the timer will start and will not stop until the robot passes the 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 60 marks shall be given upon completion.

6.1.8. The remaining time after robot reach the finishing line, will be count as points.

6.2. 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 the robot crosses the gate, the timer will start and will not stop until the robot passes the 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.

6.2.8. The remaining time after robot reach the finishing line, will be count as points.

6.2.9. There two game field for open category which are for first and second stage.

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 (5) checkpoints. A total of 100 marks shall be given upon completion.

6.3.8. The remaining time after robot reach the finishing line, will be count as points.

6.3.9. There two game field for open category which are for first and second stage.

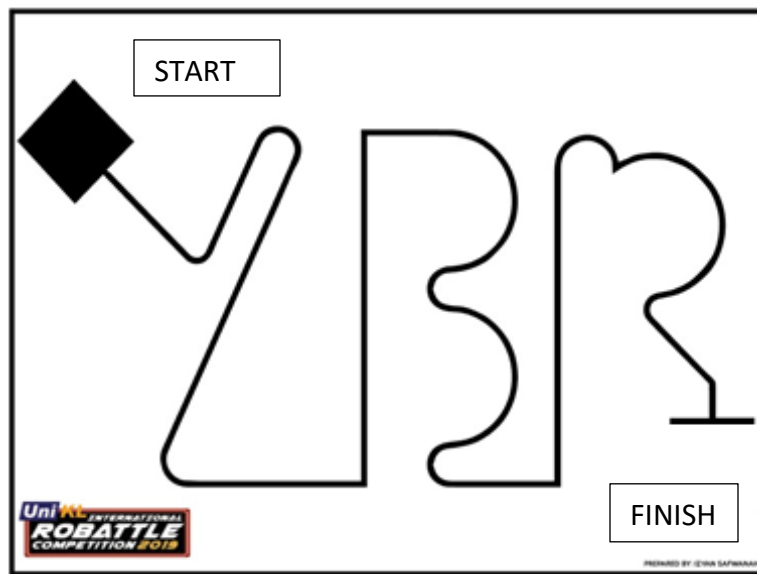## 7. GAME CHALLENGE FOR FIELD 1 (SCHOOL AND OPEN – STAGE 1)
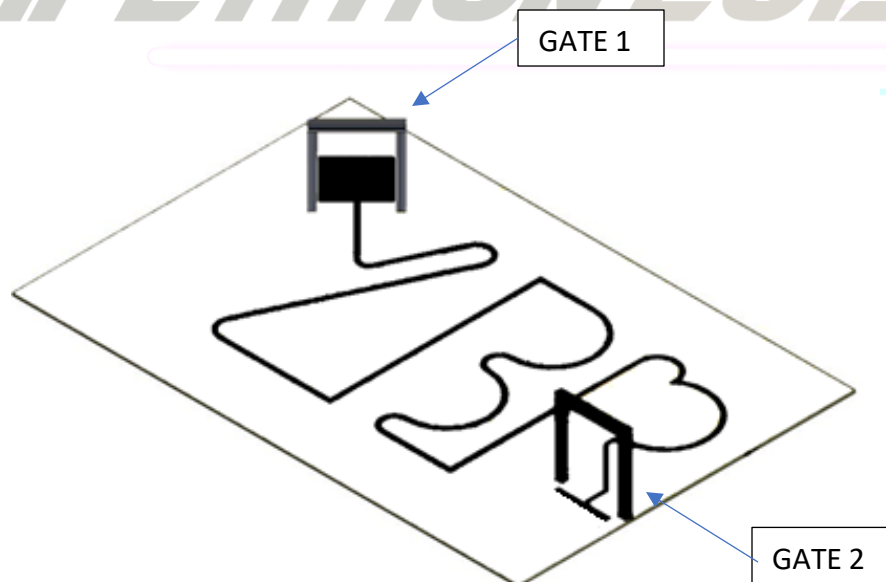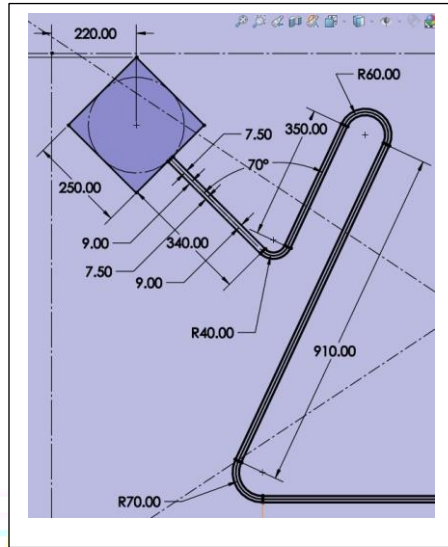

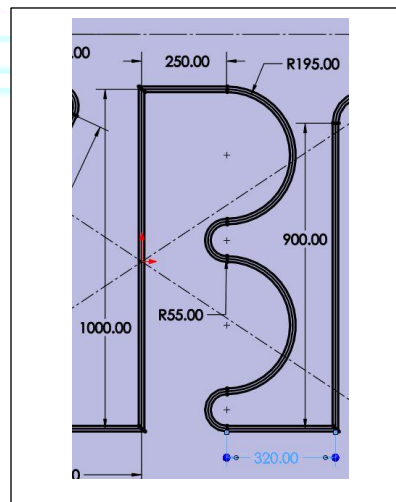*Figure 1 1st stage game field top view*

Figure 2 1st stage game field 3D view
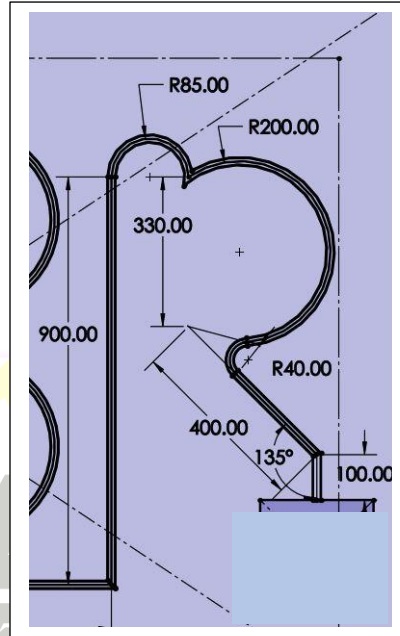
Check point 1:

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

Check point 2:

The robot must follow the line and pass all the turn. The robot cannot cut or take a shortcut. The length and angles of the track state in the picture above in millimeter.

Check point 3:

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 of the box. The timer will stop once the robot passed through the second gate. All the dimensions stated in millimeter.

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

Please refer to the adobe illustrator file provided on our official UIRC Webpage for a more detail dimension.

<u>Map will be printed on canvas (2.4m x 1.6m) BLACK AND WHITE. The line width will be 18mm</u>

8. GAME CHALLENGES FOR FIELD 2 (SCHOOL – STAGE 2)
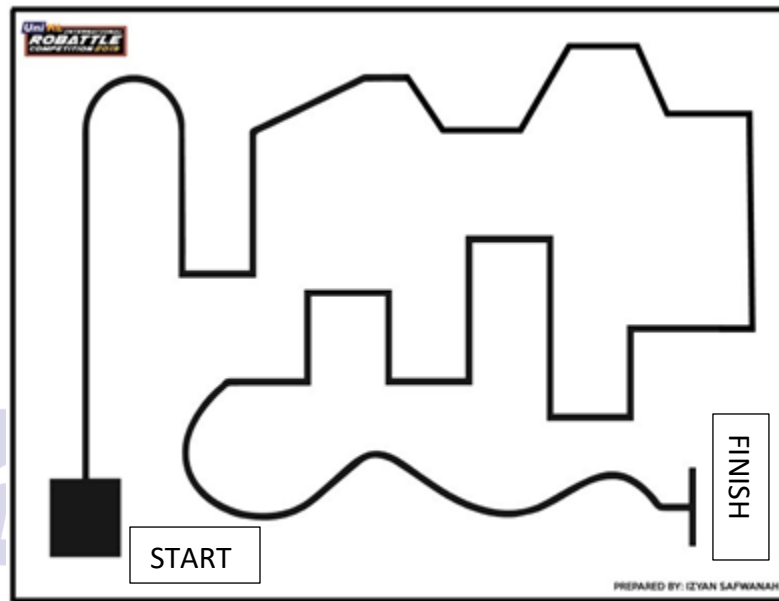
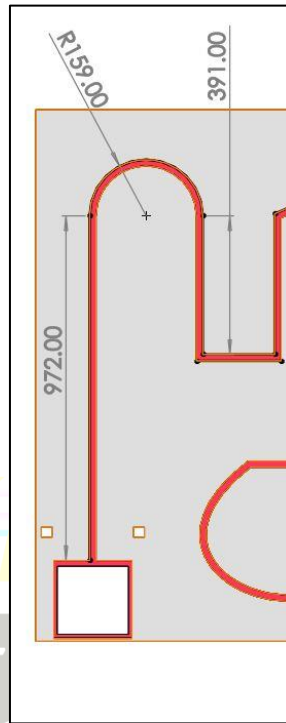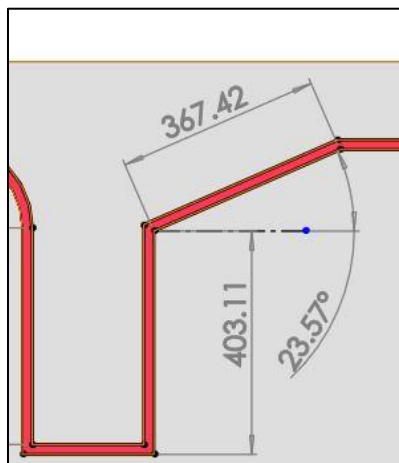

Figure 3 School Field Top View
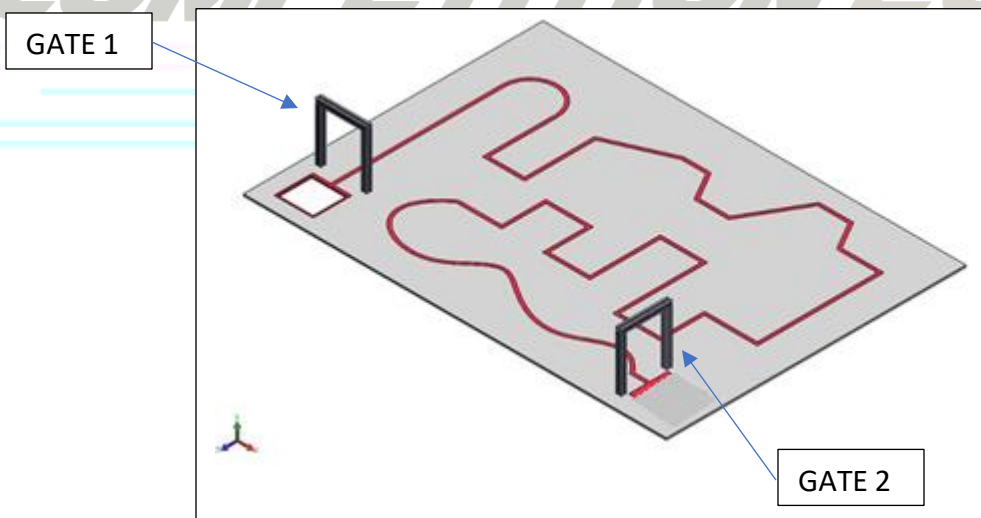
Figure 4 School Field 3D View
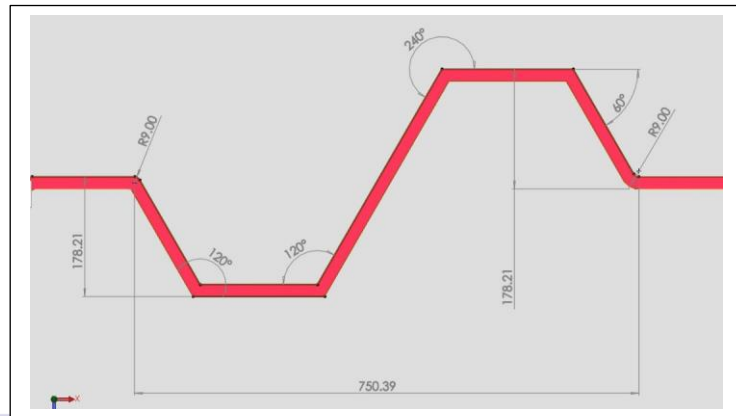
Checkpoint 1

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.
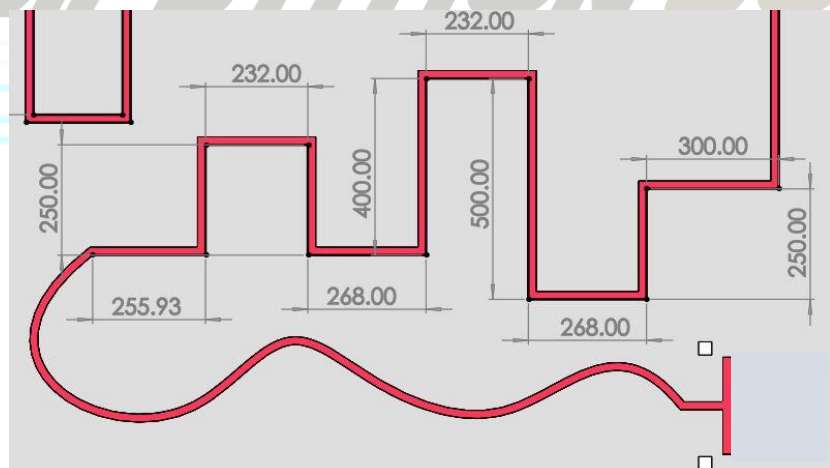
Checkpoint 2

The robot must follow all the lines and pass all the turns. All the length and angle stated on the picture in millimeter.

Checkpoint 3

The robot must follow the line and pass all the turn. The robot cannot cut or take a shortcut. The length and angles of the track stated in the picture above in millimeter.

Checkpoint 4

The robot must follow the line and pass all the turn. The robot cannot cut or take a shortcut. The timer stops once the robot passed through the second gate. All the dimension stated in the picture above is in millimeter.

Checkpoint 5
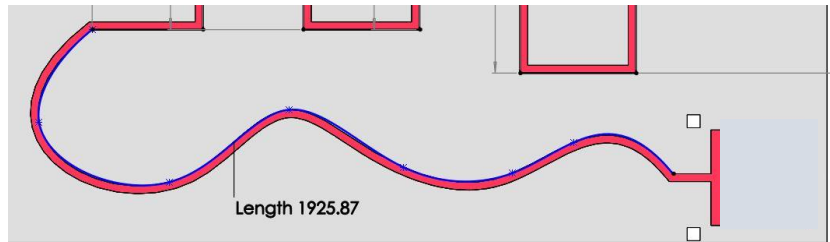
Length 1925.87

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

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Map will be printed on canvas (2.4m x 1.6m) BLACK AND WHITE. The line width will be 18mm.

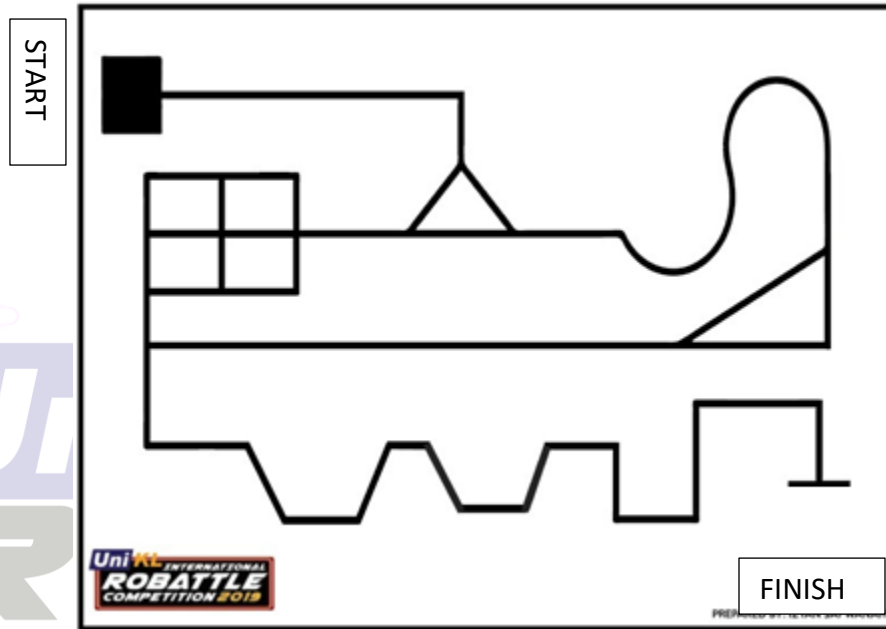## 9. GAME CHALLENGES FOR FIELD 3 (OPEN CATEGORY – STAGE 2)

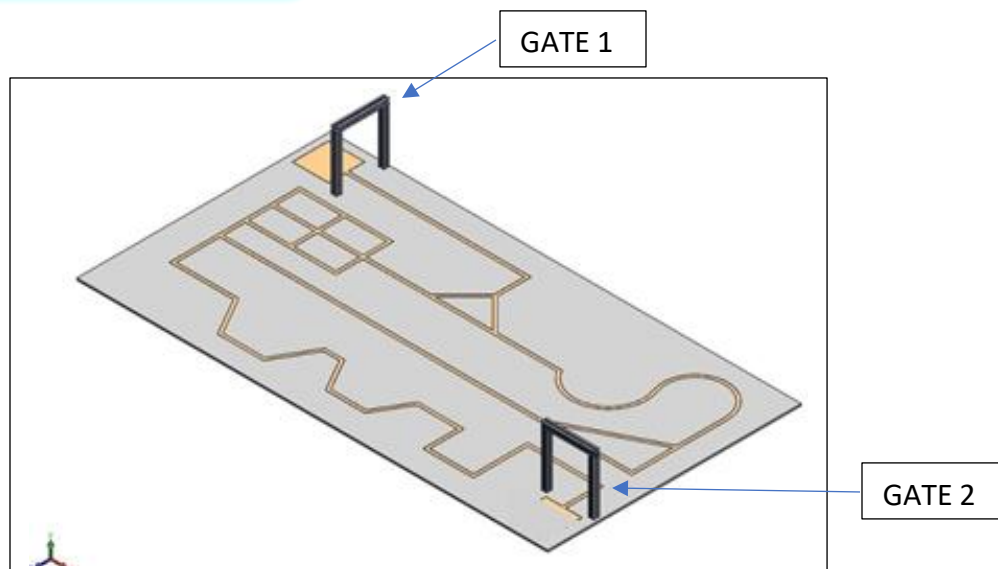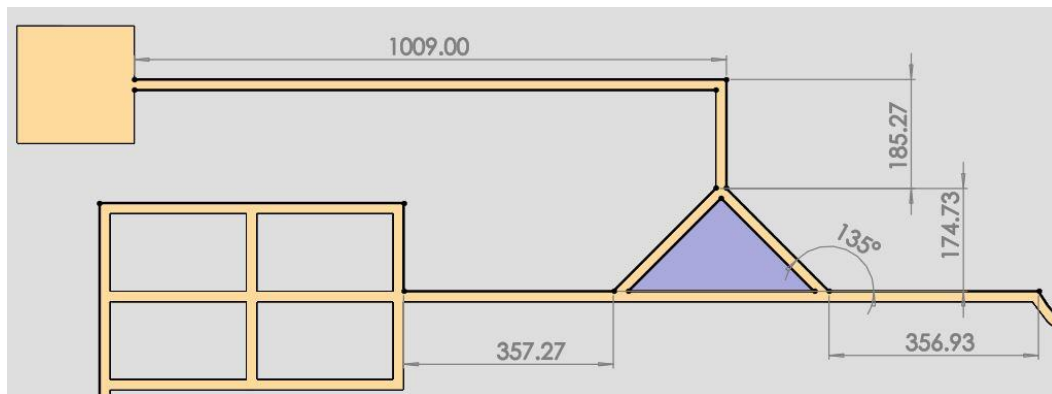
Figure 5 Open Field Top View

Figure 6 Open Field 3D View

Checkpoint 1

The robot starts from inside the box. No part of the robot can be outside the box. The timer begins after the robot passed through gate 1. The robot needs to follow the line and cannot cut or take a shortcut. All the dimensions are in millimeters.
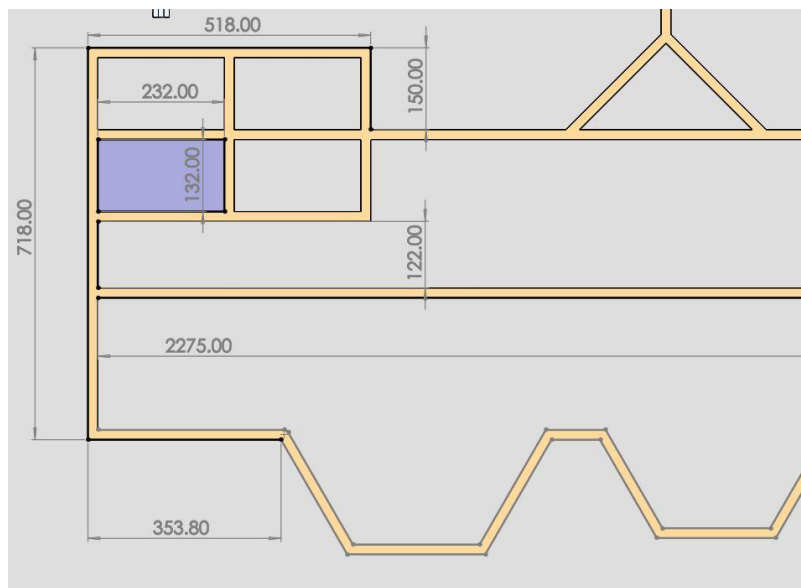
Checkpoint 2
Checkpoint 2 consist of two different path which the robot must choose between two paths after checkpoint 1.
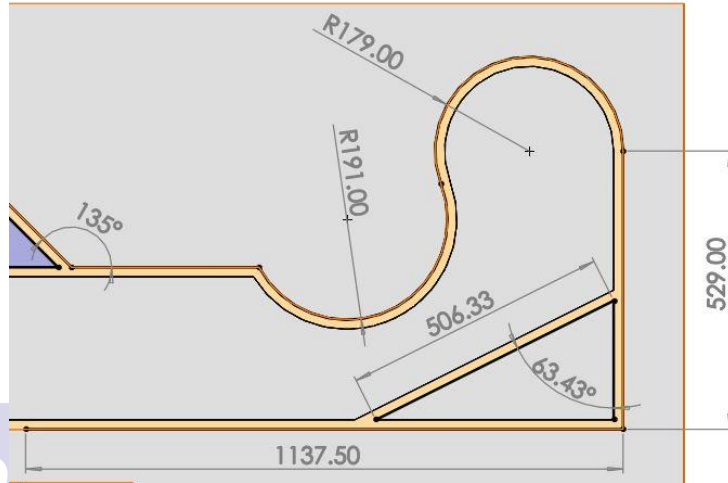
Checkpoint 2a
At this check point, the robot has to pass through it by following any black line.
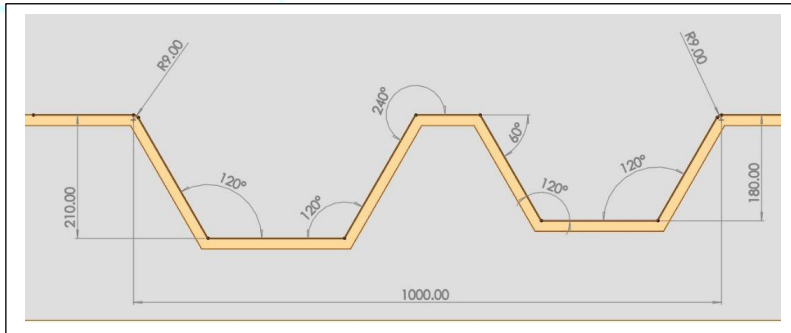 All the dimensions are in millimeter.

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 millimeters.
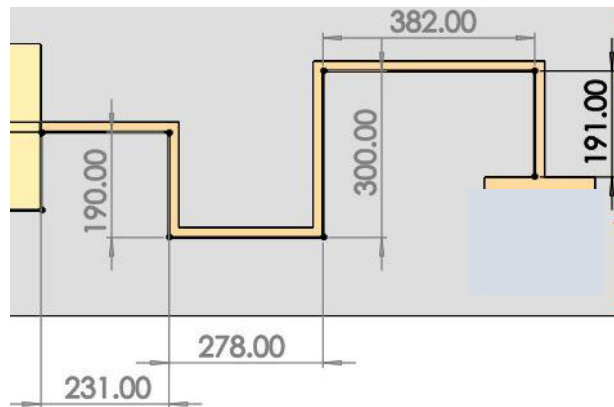
Checkpoint 3

The robot must follow the line and pass all the turn. The robot must stay and follow the line without taking any shortcuts.

The length and angle of the line stated on the picture is 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 stops once the robot passed through the second gate. All the dimensions stated in millimeters.

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.

10. GAMEPLAY

10.1.   No Elimination

10.2.   Each team will be playing three (3) sessions.

    10.2.1. First session is the first stage.

    10.2.2. Second session is the first round for second stage.

    10.2.3. Third session is the second round for second stage.

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.   School category

1st place prize   - RM300

2nd place prize   - RM200

3rd place prize   - RM100

Best design   - RM50

Best technology   - RM50

11.2.   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