

* Please be aware that this is provisional version of the rules, there may be some changes. Specially testing material of size and weight is still on progress, but still there will be new updates.

Transporter	League	Participation	Construction
	Junior/ Challenge	1 Person 1 Robot	On Site

1. Game Description

Transporter is a game that robot transport specified target to assigned goal in IROC official playfield in time. It is essential to understand participant's own robot fully, dynamics and physical laws about robot, sensor control techniques, and programming in order to construct robot and program it.

2. Robot

2-1. Robot type: No restriction

2-2. Construction (On site) Participant has to construct all machinery parts of robot except the controller and while measuring the machine the assigned size has to be followed.

2-2-2. Built on-site

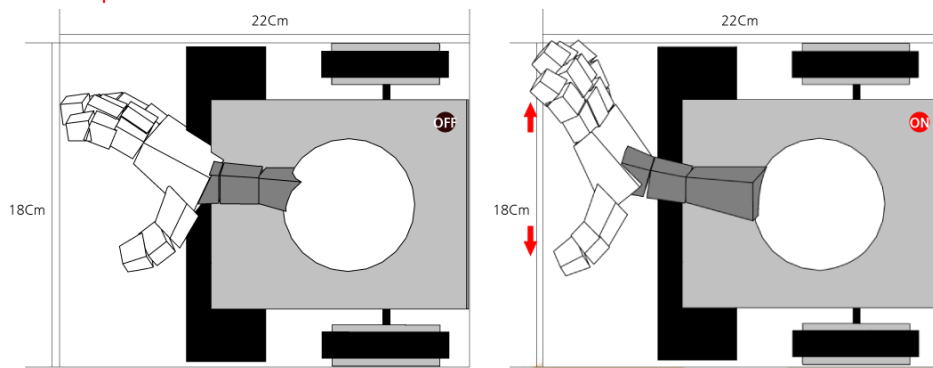
The robot should be built on-site by the participant during the construction time except for the robot controller

2-2-2. Size: Robot should be less than 18cm X 22cm (H*W)

2-2-2-1. Size measurement

- 1) Self-Check: Participant can check size of the robot in testing time of constructing zone.
- 2) Official inspection: Before the competition, referee will check the size of the robot.
- 3) Ways of Measuring: When the power of robot start to move and measures the equipment and participant cannot give any objection against the judge.
- 4) Modify: If the size is over there is a repair time but it has to be in front of the judge. If they didn't finish the job in given time it will be disqualified as overcharge size regulation.
- 5) Before check on measuring the instrument and shape if the size changes it will be disqualified.

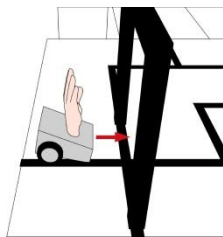
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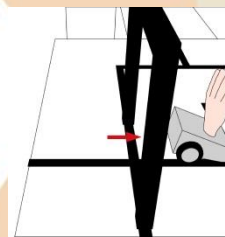
GOOD

! Over size

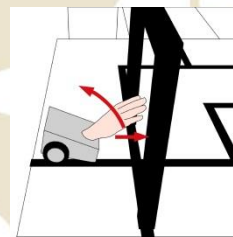
*When Length and weigh is changed, same rule applies.



<Size Measurement with figure>



<Right Start>



<Wrong Start>

2-2-2 Sensor of the Robot: No restriction

2-2-3. Power

2-3-1. Robots should work with an independent electric power supply; it cannot use a combustible device.

2-3-2. there is no limitation on type of battery or voltage.

2-2-4. Operation: No restriction

2-2-5. Structure in mission: Robot object can be move or having structure to load the object and cover with the basket.

2-3. Robot must move autonomous by the program except the starting point and it cannot be operate by the outside.

3 Competition Site

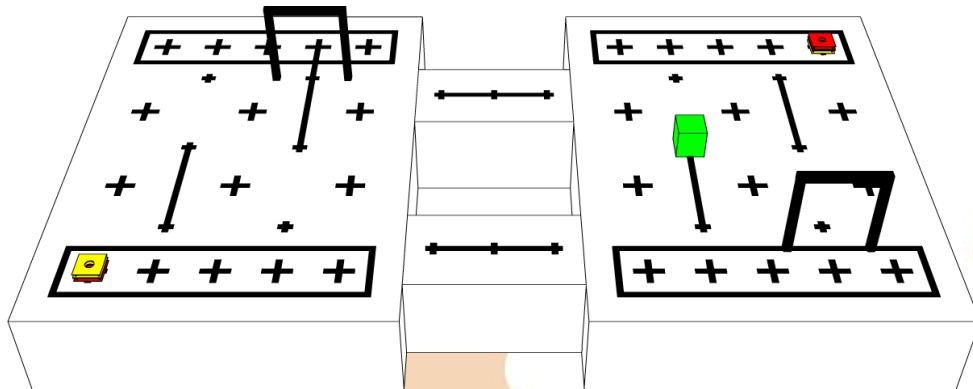
3-1. Official Site: It must be an approval from International Robot Olympiad Committee

3-2 .Size and Composition: Size has to be 160cm X 120 cm (±10% and more than two blocks has to be connected.



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EX



<Above the picture is example connection with bridge, arrangement, mission and line will be announce in the competition>

3-2-1. Connection

The size of competition has to be 25cm ($\pm 10\%$) and bridge is connected with straight line and curve field is stick with tapes and paper sheets.

3-2-2. Site error prohibited range

The gradient of site has to less than 2 ($\pm 10\%$) and there might be gap or bumpy which can be less than 3mm.

3-2-3 Prevention to stop falling robot

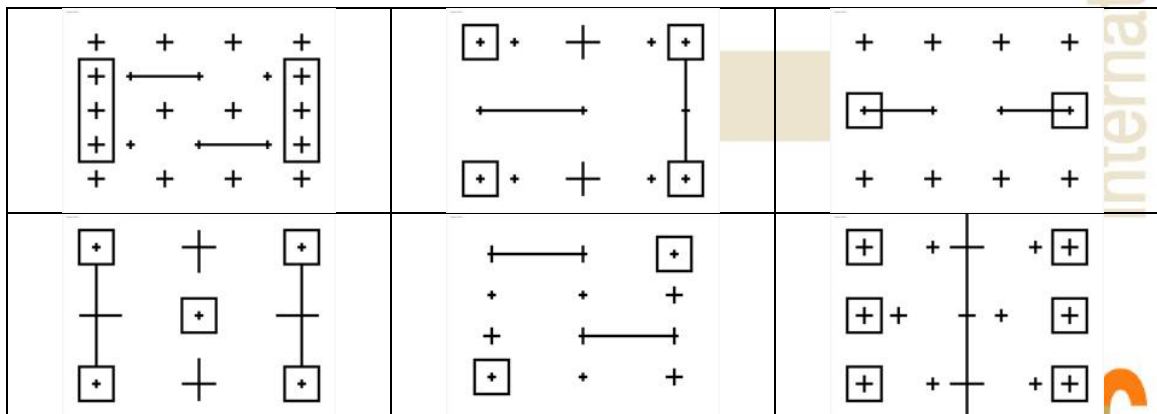
There will be no special structure for prevention to stop falling.

3-3 Field

It is cover with glossy coat sheet paper, advertisement, logo from the organizers.

3-3-1 Mission Map

It is consist of different kinds of cross size and straight line of combination



< Mission map is use as following example in Transporter 2016 >

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3-3-2 Line

The color of line is black width of 2cm ($\pm 10\%$)

3-3-3 Installation of measuring instrument

In order to measure the time , starting and ending point measuring instrument will be installed, according to mission the direction can be changed, structure that is connected to the field can be used.

3-4. Appendage of Competition Site

3-4-1 Target area

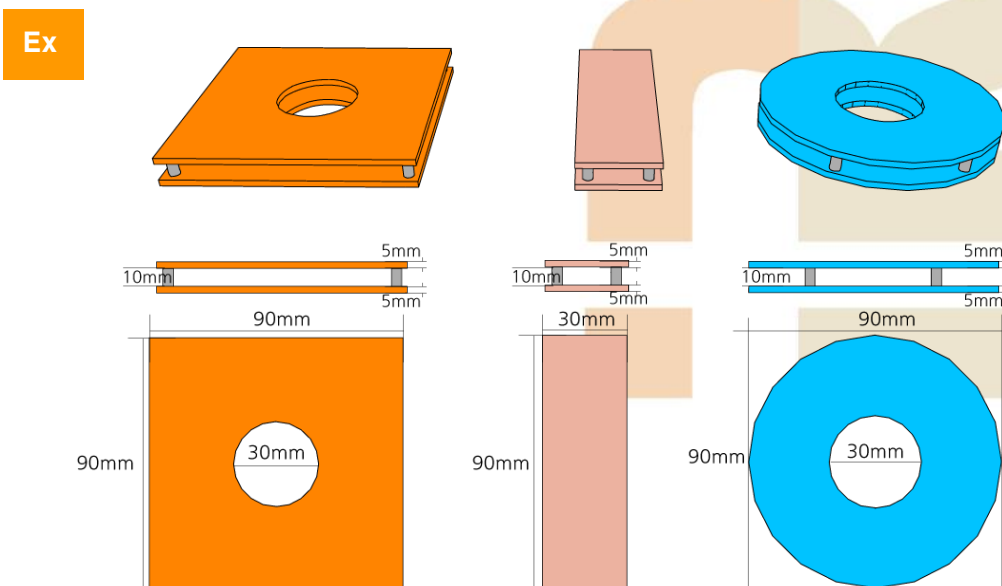
The Weight is between 200g ($\pm 10\%$) can be used in square, Archetype and Rectangle pallet size blocks

3-4-1-1 Size of a Target

- 1) Square: 9cm * 9cm * 2cm ($W*H*H, \pm 10\%$)
- 2) Archetype: 9cm * 2cm ($W*H*H.\pm 10\%$)
- 3) Rectangle: 9cm * 3cm* 2cm ($W*H*H.\pm 10\%$)

3-4-1-2 Size of a Support

- 1) Square: 8cm ($W*H*H, \pm 10\%$)
- 2) Archetype: 6cm ($W*H*H.\pm 10\%$)
- 3) Rectangle: long side 8cm, short side 1cm ($W*H*H.\pm 10\%$)



3-4-1-3 Allocation

Following mission, the intersection points can be above the starting point and fixed in site of competition.

3-4-2 Destination

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According to the mission, site field intersect provisionally.

3-4-3 Obstacle

It can give a physical limitation in order to move and fixed the structure.

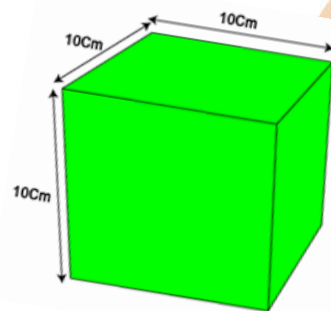
3-4-3-1 Size of an obstacle

It is based on regular hexahedron 10cm x 10cm x 10cm ($W*H*H, \pm 10\%$)

3-4-3-2 Allocation

According to the mission, it can assign in intersection and above the starting point.

Ex



<Obstacle>

4. Competition progress

4-1. Way of Game Method

Game will be result in two second of row and each time difference will be a rest time to check and repair once more.

4-2. Construction and practice time

Construction and practice time is less than 2 hours and it will post in competition day.

4-2-1. Allocation of competition site

It will allocate based on number of participant and level of difficulty of the game.

4-2-2 Production and Practice

Participants can do the practice until the end of posted production but before the game is prohibited.

4-3. 1st Run

After the construction and practice time the 1st run will begin.

4-3-1. preparation of the game

All of the participant has to take the robot out and be ready from referee and volunteer's instruction.

4-3-2 after the game standby

When participant is finish with their game, they have to stay and watch all of the participant game until end of the competition day. Copyright©. All right Reserved.

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4-4 Repair Time

After the end of 1st run, the entire participant has 30minutes repair and practice time.

4-5. 2nd Run

After the repair time, 2nd Run will start to begin in the match.

4-5-1. preparation of the game

All of the participant has to take the robot out and be ready from referee and volunteer's instruction.

4-5-2 Stand by

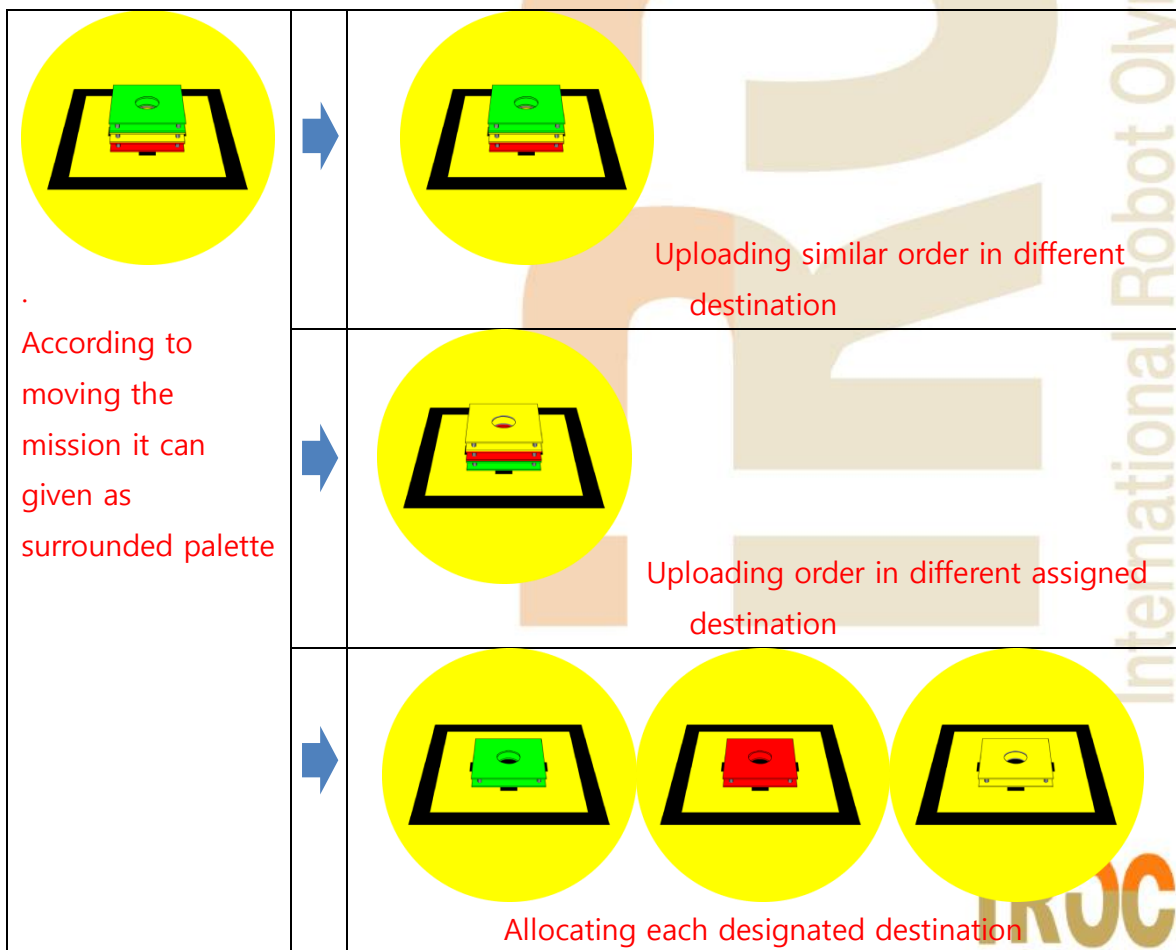
All of the participants finish with their game; they will go back to their seats.

5. Competition

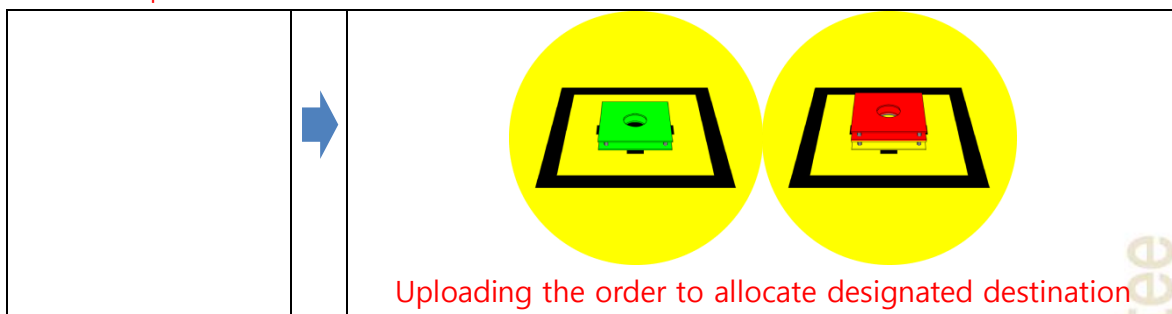
5-1. performing the mission

Course of run and order of carrying is not designated but participant can decided freely.

Ex Example of Mission



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5-2. Start

They have to wait of sign from the referee and measuring instrument had started it will be the starting point. If they didn't start from the sign has to restart again.

5-2-1 Miss Start

If there was a miss start regarding the starting signs, time counted from 5 and the robot doesn't start it will be miss start and there will be one more chance to the team.

5-2-2 Restart

There will be second chance (including first start make 3 times), if the team miss following with the chances, it will be miss start and impossible to start the move.

5-3. Arrival

Line installed in measuring instrument of the robot or arriving at intersection of the point (Robot needs to install the line of measuring instrument or stop at intersection point) had to stop the time measuring the instrument.

5-3-1 Mission

Robot arrives at the finishing point the referee counts until 3 second it will be admitted to reach the final stage of the game.

5-4 Limited Time

If teams do not complete the mission in two seconds, the match will be over and result will before the finishing point.

5-5 Opening the Mission

Before the game the team has to follow is line structure, location and number of destination and object also shape of bridge in site of competition will be shown as given mission to participant.

5-5-1. moving the target

It can be move not by destination but the location.

5-5-1-1 Violation

If target attached with the floor go along the intersection then point does not count.

5-5-1-2 Standard

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The sensor of robot is allocated in intersection headed to target and loading it up then it is violation move.

5-5-2 Numbers of moving target

It can be move only once in during the moving direction.

5-5-3 Adjustment of target

The double touch is possible from the target which is move from the direction, and there are no limitations of numbers of target.

5-5-4 Loss of target

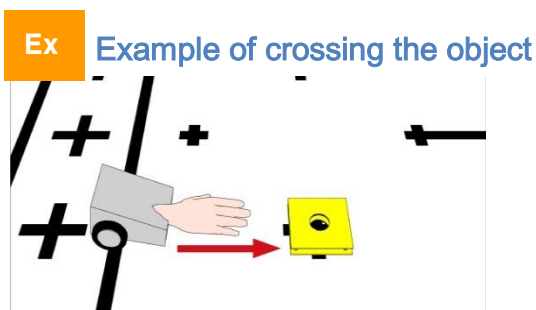
Robot which had is collapse from outer site of competition cannot be reused.

5-5-5 Crossing

Robot can cross the target location

5-5-6 touching the obstacle

There is limitation of physical part, but the point will not be deducted from the participant.



5-6 End of Competition

If robot could not continue match, referee will announce the match is over.

5-6-1 Robot Stop: If the robot doesn't move the referee will count 10 seconds and if the robot still could not move call it a stop and count the points before reaching the end point.

5-6-2 TKO (technical knockout): During the match, robot had been stopped over the structure and obstacle and could not start with the motion referee will decide the match cannot restart the reason of repeat motion of robot and it will be announce TKO and result will be admitted before the TKO.

5-6-3 leaving the line

If the robot is not on the line the match will be stop and before coming to this area resulted will be admitted.

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5-7 Due to disqualification of ending the match

During the match, when participant violate the rule or making interruption the match will be ended but result will be not admitted.

5-7-1 Robot Touch

During the match, participants touch the robot without judge and supervisor authorization it will be robot touch and disqualified.

5-7-2 Repair time during the match

During the match, additional, remove, exchange, changing the toll is prohibited but during the standby to repair the robot the participants has additional battery then the team will be disqualified.

5-7-3 sensor turning

Before the competition, there was a sensor turning situation happen then it will be disqualified.

5-8 Rematches

During the match when it had been black out and breakdown of measuring instrument happens referee and coach can make a decision to do rematch.

6. Scoring the Result

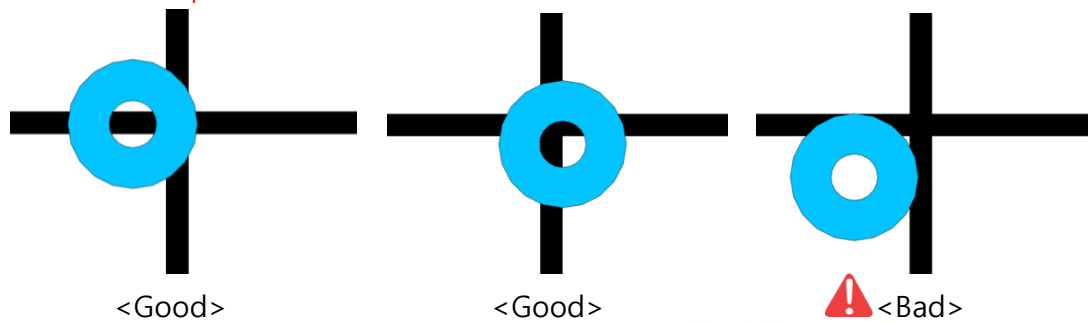
6-1. Ranking decision article

Mission points and time record of the target, stop mission of finishing line.

6-2. Mission point

When the game finished, finally in the destination they will look over the object and decided the success of result. Some of target will be close to area and it's hard to look then it will be failure. The entire decision is upon the referee.

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6-3. Time record

Time record is based on the measuring instruments.

6-4. Final score

Better score out of 1st and 2nd run will be the final score.

6-5 Order of priority to result

Groups will be divided according to the group and their record will be compared and result has to be decided, the arrival point if they succeed the stop mission the result will be on the top.

Number of success object > Time record > Success of stop mission > Compare to time result

6-5-1 Order of priority according to present

If it's the same result in the present time then the referee needs to look at the other time of the record and decide the result.

6-5-2 Order of priority according to Tie-Breaker

In order to sum up the best result from first and second chance, if it's a tie it will be 1st to be in best rank.

※ Common

1. Seat and electricity use

1-1. Seat

IROC chooses participant's seat and it's not negotiable. Failure to obey may lead to cheating will give a penalty to the team.

1-2 Electricity use

Two participants are seated in one table. One power socket is given per each participant. Participants are allowed to bring and use multi-tab

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2. Computer use

Participant who needs the computer to use in competition, they need to bring it but notebook which had battery inside is prohibited. Mostly in competition sites the electricity is not that stable so computer which does not assist the battery could happen in serious accident toward the participant.

3. Match place environment

3-1. Light interference

Participant should be prepared to control robots under electrical lightings, sun-lights, and photographing.

3-2. Signal interference

Participant should be prepared to control robots under electrical signal interference by electrical material, communication device.

4. Carry restriction and prohibition

4-1. Carry restriction

Participant can carry storage devices including MP3 player, PMP but make sure that it is switched off before entering the playfield. If this misbehavior is found, he is disqualified.

4-2. Carry prohibition

Participant cannot carry storage devices including USB memory, and any material related with robot and manual. Also it is not allowed during competition. If this misbehavior is found, he is disqualified.

5. RFID card: Must wear around neck to participate.

6. Uniform: Participants has to wear the official inform to participant in the tournament.

7. Material prohibition

7-1. during the match

No material is allowed during competition. Material must be delivered to students before competition begins. If this misbehavior is found, he will be asked to leave.

7-2. Lunch time

If lunch time is included during the match, you are not allowed to carry any

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materials out of playfield. Also you are not allowed to bring any materials in the playfield after lunch time.

8. Cheating

If cheating is found, warning is given at the first time, and disqualification is given at the second time.

8-1 Leave

8-1-1. Communication with spectators or other participants

8-1-2. Use of part of robot that is not authorized before match

8-2. Warning (gain two warning lead to leave)

8-2-1. touching or damaging other participant's robot, laptops, or belongings

8-2-2. not obeying referee or marshal. Disrupting order

9. Site arrangement

Referee and supervisor can assign practice playfield and restrict practice time per participant / team to manage equal and fair practice time.

10. Match result confirmation

Participant should be prepared to control robots under electrical lightings, sun-lights, and photographing.

11. Duplication of participate

It is possible to participate in each event but it is assigned in same day, it is upon to the participant. But there will be no extra time.

12. Others

Committee will decide other unspecified rules and notify on match day. It is not allowed to object.