



# IIUM ROBOTIC COMPETITION (IRC) 2023

## RULES AND REGULATIONS: SOCCER ROBOT

### 1. Objective

In Soccer Robot match, two teams will compete with each other to score a ball into the goal with a maximum of two robots in each team. Teams that scores most goal will be declared the winner. Robots have to be manually operated using a wireless controller.

### 2. Game Field

- 2.1 The field consists of an area having the dimension of 2400 mm x 1200 mm surrounded by a wooden wall.
- 2.2 Each corner of the field is covered with a triangle.
- 2.3 The field surface is flat, non-reflective black paint.
- 2.4 The goal is 400mm wide. With no post or nets but with sufficient open space where the ball can go through.
- 2.5 Normal golf ball shall be used as the soccer ball with a dimension of 43mm diameter and 50g weight.

### 3. Robots

- 3.1 Two robots per team are allowed to be on the field.
- 3.2 The size of each robot is limited to **150mm (L) x 150mm (W) x 150mm (H)**. The height of the RF communication antenna will not be considered in deciding a robot's size.
- 3.3 Each robot's weight should not exceed 1.5kg including battery.

- 3.4 Each robot must be fully independent, with powering and self-contained. Only wireless communication is allowed for all kinds of interactions between controller and robot.
- 3.5 **None of the robots allowed to trap or hold the ball such that more than 30% of the ball are out of view either from top or sides of the robot** (Refer Appendix B)
- 3.6 The robot shall not damage the game field.
- 3.7 Flying robot is not permitted.
- 3.8 The robot must be wirelessly controlled. Wired and/or autonomous are strictly prohibited. The remote control (transmitter and receiver) between the robot and operator must be secured properly and with changeable frequency or connection to avoid interference with other robots.
- 3.9 **The robot shall not be designed to deliberately push the opponent's robot.**
- 3.10 Each team is responsible to ensure wireless control is secured enough to not be interfered or hacked by others. Organizer will not be responsible for any interference during competition.

## 4. The Competition and Scoring

### 4.1 Game Durations

- 4.1.1 The game time will last for 4 minutes with two periods of 2 minutes each.
- 4.1.2 The time will be paused if there are interruptions.
- 4.1.3 There shall be no break between the two periods.

### 4.2 Game Commencement

- 4.2.1 Before the commencement of the game, kick-off is decided by the toss of a coin.
- 4.2.2 The winning team may choose to start kick-off, while the losing team will then choose a side to play.
- 4.2.3 At game commencement, each team must have at least 1 proper working mobile robot on the playground.
- 4.2.4 In any case that a team cannot start with 1 robot, the team will be disqualified.
- 4.2.5 If robots become dysfunctional during the game, the game will still continue.
- 4.2.6 However, the dysfunctional robot must be replaced or removed.
- 4.2.7 During the game, if the ball went out of the fence or got stuck, referee will position the ball at the center point.
- 4.2.8 At the beginning of game halves or after a goal has been scored, the ball is placed at the center point.
- 4.2.9 The team will be allowed to position their robots freely in their own side or area.

4.2.10 With a whistle blow from the referee, the game is started and all robots may move freely.

4.2.11 When two robots same team inside a penalty box, one of the robot will be reposition to the center of the field

4.2.12 At half time, the teams will change their playing sides.

### 4.3 Winning

4.3.1 A goal shall be awarded when the whole of the ball passes over the goal line.

4.3.2 The winner of a game shall be decided on the basis of the number of goals scored.

4.3.3 In the event of a tie after the second half, the winner will be decided through penalty-kicks.

4.3.4 During the penalty kick, one robot will be required to hit the ball only once from the center point into the goal. The opponent robot will be removed from the field.

## 5. Disqualification

- 4.1 Causing or attempting to damage the game field, the equipment on the field or the opponent's robot.
- 4.2 Performing any act against the spirit of fair play and friendship between participating teams.
- 4.3 The team that does not follow the instruction or warning of the referee.
- 4.4 Team not complying with the rule on the dimensions of the robots.

## 6. Others

- 5.1 For any dispute not specified in the rules, referees are given full authority to make a decision and their decision is final.
- 5.2 All teams are encouraged to decorate the robots to reflect the culture, aesthetics and styles of their respective educational institute or country.
- 5.3 When designing the robot, the teams must take into account that there will be some uncontrolled environmental parameters that might affect the robot's behaviors.

## Appendix A: Competition Format

The contest is played according to the following format:

1. Preliminary Rounds: Round robin within groups
2. Selected winners from each group shall advance to knockout round.

## Appendix B: Trapping the Ball

