



ENGINEER CHALLENGE

GENERAL RULES

2022/2023



organized
by





1. THE ROBOT



1.1.

Only LEGO branded parts are allowed to be used when building the robot. Controllers, motors and sensors have to be from the below mentioned LEGO Education Robotics sets:

- LEGO Mindstorms EV3,
- LEGO Mindstorms Robot Inventor,
- LEGO Spike Prime.

The only allowed non-LEGO part is the HiTechnic Color Sensor. Teams can only connect motors and sensors with LEGO branded parts.

Rule infringement: In case a robot has any non-LEGO parts the team is disqualified from the competition.

1.2.

Teams have to make sure they have all the needed equipment to compete: robot, spare parts, laptop/tablet, software, cables, game mat, game objects etc.

1.3.

Teams have a free choice of what software or firmware they use on the controller.

1.4.

The maximum dimension of the robot before it starts the robot run is 25 cm length and 25 cm width. The height of the robot is not limited. After the robot starts the robot run there is no limit to its dimension.

Rule infringement: In case a robot does not fit the mandatory dimension limits before it starts the robot run, depending on the scale of infringement the team will either get a 50% deduction from its final score or will be disqualified from the competition.

1.5.

The robot has to function autonomously during the robot run.

Rule infringement: In case of any rule infringements see points 4.4. and 4.5.





1. THE ROBOT



1.6.

The display and front of the controller has to be clearly visible on the video recording before the robot run starts, so that judges can make sure that the Bluetooth and WiFi is switched off.

Important: Leaving out a visible view of the display and the front of the controller on its own does not count as a rule infringement. However, it is in the best interest of the team to include that, because if judges suspect that the robot is remotely controlled they might rule against the team if they lack any evidence of a switched off Bluetooth or WiFi (see points 4.4. and 4.5.).

1.7.

Before the robot run starts, but the robot is already on the game mat, it is forbidden to upload any program (both using a wire or wireless method) or to make any calibrations of the sensors.

Rule infringement: In case a team violates the rule the team is disqualified from the competition.

1.8.

It is forbidden for two or more teams to compete with the same robot, even if they share a common location (e.g. school, home etc.). Robots have to be distinctively different in appearance, structure and programming.

Rule infringement: In case the rule is violated , both or all teams involved are disqualified from the competition.



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2. GAME FIELD SPECIFICATIONS



2.1.

Size of the game mat is the same in all four age groups: B0, that is 1000 mm x 1414 mm.

2.2.

The registered teams have to make sure to acquire the game mat in time (print, order etc.). The acquired game mat has to have the exact same dimensions, areas, colors and graphics as the shared document.

Rule infringement: In case the game mat is manipulated by any means, the team will be disqualified from the competition.

2.3.

The team can decide what material they choose for the game mat. It is important to keep in mind that it should not wear out easily as a lot of practice will take place on it. We recommend the following materials as they proved to be good for this purpose:

- 510 g/m² PVC tarp (Frontlit),
- 170 mic polypropylene film matte grayback paper.

2.4.

The printable, finalized version of the game mats will be available for registered teams via the platform after logging in.

2.5.

The game mat should always be placed on a leveled horizontal surface.

2.6.

All game objects should be acquired by the teams based on the list of game objects sent to them by the organizers. Game objects will be everyday household items or easy to access objects that have an approximate standard size globally.





2. GAME FIELD SPECIFICATIONS



2.7.

Teams cannot place any objects next to the game mat that alters or affects the functioning of the robot. This means that no such object can be used as a barrier or reference point by the robot.

Rule infringement: In case this rule is violated by a team, the team will be disqualified from the competition.

2.8.

There is an explanatory video created about the general and age group rules that you can and should watch. Coming soon on the website.



3. THE COMPETITION



3.1.

The Engineering Category competition period will start with an official opening ceremony 8:00 CET 21st January 2023

3.2.

The video recording of the robot run and the documentation of the program has to be uploaded to the competition platform by 23:59 CET 25th January 2023. Recordings and documentations will be rejected after the deadline. We encourage teams to upload the video and the documentation earlier than the deadline and not to leave it for the final moments.





3. THE COMPETITION



3.3.

The recorded video of the robot run has to include the followings:

3.3..1. The recording has to include an all-angle view of the robot with a zoom in on the display of the robot, which also shows that Bluetooth and WiFi are switched off. The team also has to show that the robot is within the legal dimension of 25 cm width and 25 cm length by placing the robot inside the 25 x 25 cm start area.

3.3..2. The video has to include an overall recording of the game field where judges can clearly see the 30 cm rulers placed on the reference points and all graphic images on the mat are visible. This way judges can make sure that the game mat has the valid size, colors and graphic images and there it is not manipulated in any way.

3.3..3. It should also include a zoomed in view of all the game objects and their positions on the game field.

3.3..4. Robot can start after these are recorded and the whole robot run has to be on the video as well.

3.3..5. At the end of the robot run (no matter how it ends) when the robot is not moving anymore the team has to record a zoomed in view of the end positions of all the game objects on the game field.

3.4.

The video has to be one uncut recording. It is forbidden to manipulate the video, including any cuts, movie tricks, etc. Important to note that the competition round technically starts when the recording starts, meaning that all competition run rules apply to the whole recording. However, the time of the robot run starts when the button is pushed on the robot and ends according to points 3.9. and 3.11. We suggest that teams should practice the recording before doing the actual footage. It is also worth recording even the practice runs as well, because you never know which one is going to be the best one.

Rule infringement: In case a team applies any cuts, movie tricks or any other manipulations to deceive the judges, the team will be disqualified from the competition.





3. THE COMPETITION



3.5.

One team can only submit one video file by uploading it on the competition platform. The file should be named: TEAM NAME_AGE GROUP_EDUROBOTICSCUP2022 (e.g.: MARIOBROTHERS_ROOKIE_EDUROBOTICSCUP2022).

3.6.

Allowed formats are: mp4, avi, wmv.

3.7.

The uploaded videos will be publicly available online for anyone to watch once the upload deadline expires (23:59 CET 25th January 2023).

3.8.

Teams have to upload the documentation in PDF format to the competition platform with the name: TEAM NAME_AGE GROUP_EDUROBOTICSCUP2022 (e.g. MARIOBROTHERS_ROOKIE_EDUROBOTICSCUP2022).

3.9.

The robot has 2 minutes at maximum to do all the tasks, the maximum time of a robot run is 2 minutes (120 seconds). The timer starts when the team member pushed the start button on the controller. At this point the timer and the robot run starts even if the robot does not start to move.

3.10.

The robot can solve the tasks in any order.

3.11.

The robot run ends and the timer stops when:

- the available 2 minutes are over,
- a team member or anyone else touches the robot, the game mat or any game objects,
- the robot completely leaves the game mat, meaning that no part of the robot is touching the game mat.





3. THE COMPETITION



3.12.

Judges will measure time with a stopper when they watch the uploaded videos. In case the robot is not finished within the limit of 2 minutes, the judge will stop the video at the 2 minute limit and tries to give scores that are earned up to that point. Since in this case the judge does not have a definitive recording of all the game objects, they will give only points that are achieved undoubtedly. This makes it even more important that teams check their recording before upload to make sure their robot finishes all tasks within the 2 minutes.

3.13.

Once the deadline for uploading the videos is over and judges are finished with the scoring teams have to confirm their score to finalize it. Deadline for confirming the score is: 23:59 CET 30th January 2023

3.14.

1.1. Teams have a chance to appeal against their scores in email sent to judge@wro.hu. Deadline for sending an appeal is the same as the deadline of score confirmation: 23:59 CET 30th January 2023.

3.15.

Ranking is done separately in each age group and is based on the score the team achieved. In case there two or more teams have the same score the team who was quicker achieving that score is ranked higher. If the score and robot run time are both equal then both teams are ranked in a tie.

3.16.

The final score can never be minus, the minimum score is 0. If a team achieves 0 points, their robot run time is automatically 120 seconds. Teams with 0 points will be listed at the end of the ranking table.

3.17.

If a team fails to upload a video by the deadline the organizers will consider that a 'no-show' and the team will not appear in the official rankings.





4. PROHIBITIONS AND RULE INFRINGEMENT CONSEQUENCES



4.1.

It is not allowed to use any non-LEGO parts on the robots or to modify any LEGO parts. It is not allowed to use any materials to fix parts of the robot (e.g. screw, nail, glue, tape etc.).

Rule infringement: In case a team violates this rule regarding the game objects, the team will not get points for that object. In case a team violates this rule regarding the robot, the team will be disqualified from the competition.

4.2.

It is forbidden to use colors different than those mentioned in the official rules regarding lines, areas on the game mat and game objects. In case of game objects where color is not important (meaning the color is not specified in the rules) teams can use any colors they want.

Rule infringement: In case a team violates this rule regarding the game objects, the team will not get points for that object. In case the team violates this rule regarding the lines, areas of the game mat, the team will have a 50% deduction from their final score.

4.3.

Two or more teams cannot use the same robot or have identical robots. In case two teams appear to be using the same robot or have identical robots the head judges will investigate the case.

Rule infringement: In case a violation is established the violating teams will get a 50% reduction from their final score or get disqualified from the competition depending on the extent of the violation.

4.4.

It is forbidden to control the robot by wire or remotely in any way. Suspicious cases will be investigated by the head judges (e.g. matching the uploaded program with the movement of the robot etc.).

Rule infringement: If a team violates this rule they will get disqualified from the competition.





4. PROHIBITIONS AND RULE INFRINGEMENT CONSEQUENCES



4.5.

After the start button is pushed it is forbidden to touch the robot, the game mat or the game objects, especially to move or push them.

Rule infringement: in case the rule is violated the robot run ends at that moment (see point 3.11.). The team will not get any points for the game objects that has been manipulated by the violation but can receive points for other tasks solved up to that point.

4.6.

The robot is not allowed to entirely leave the game mat, meaning it at all times it has to touch the game mat with at least one part of it. If the robot is no longer in contact with the game mat in any way, the robot is considered to left entirely the game mat. In these cases any game objects that the robot is handling are not considered part of the robot.

Rule infringement: If the robot leaves the game mat for the first time during the robot run, the team will get a 50% reduction from their final score. If the violation happens a second time, the team is disqualified from the competition.

4.7.

The main aim of judges and head judges is to provide an equal and fair competition for all participants. In case of a rule infringement judges and head judges will try their best to impose a necessary and proportionate penalty for the team. Head judges will always be the ones who confirm the final penalties. The penalty options are listed in the rules, however after further investigations if the violation is complex head judges can alter from those. The penalty options are:

- Disqualification from the competition.
- 50% point reduction from the final score.
- Time penalty that can be 30 or 60 seconds and is added to the robot run time.
- Point subtraction, when points are not awarded for a game object or a task.





5. GUIDELINES



5.1.

Participating teams understand and accept that the main aim of the competition is to score teams by their own intellectual and engineering skills. Organizers of ERC believe that the competition in itself is rewarding for the teams and it provides development and entertainment for the teams. With registration teams announce that the team developed, built and programmed their robot on their own with guidance and technical help from parents, teachers, coaches.

5.2.

All organizers of the competition stand for a fair, sportsmanlike competition and will maintain the integrity and clarity for the rules at all times.



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