

IDE ROBOTICS 2021

(Secondary Schools)
Competition Manual

Event Organiser:



Education Partner:



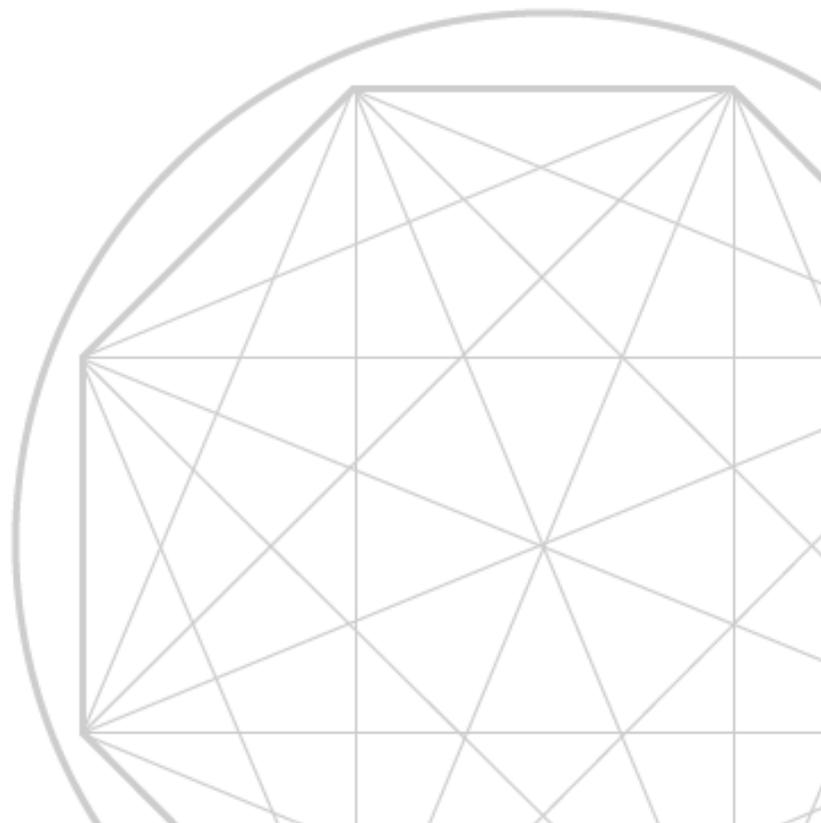
PREFACE

The pandemic has wreaked havoc all over the world, killing thousands of people, and infecting millions more. Those infected were left with permanent lifelong medical problems, while those who weren't infected were also suffering the economic consequences of a lockdown as healthcare systems were swamped and governments panicked. Concordia, a technologically advanced country, swiftly closed the borders and imposed safe distancing measures. These have worked, for now. But Concordia isn't safe. While the citizen population remains unvaccinated, infections have been seeping through and businesses have not been able to operate as usual.

To aid the recovery process, the government of Concordia is beginning a robotics initiative. The details of which will be released during the actual competition itself. But for now, we can make certain intelligent guesses of what these initiatives might be, and design a robot which would be suitable for this mission.

Note that this manual is not the final competition rules – those will be released only on the actual competition day itself. This manual is meant to give you enough details to design and plan how to execute the mission.

During the actual competition day itself, you will be expected to adapt your robot build and code to the new rules/requirements accordingly, but you may design, build and pre-program a robot based upon the details outlined in this document.



IDE ROBOTICS 2021 PLAYFIELD



GAME PLAY

Crucial Skills necessary

The robot will need a device to grab or store LEGO brick props of different sizes. For Secondary Category, colour scanning will be necessary. Finally, the robot will need to follow the line and be able to navigate through junctions.

Released Objectives

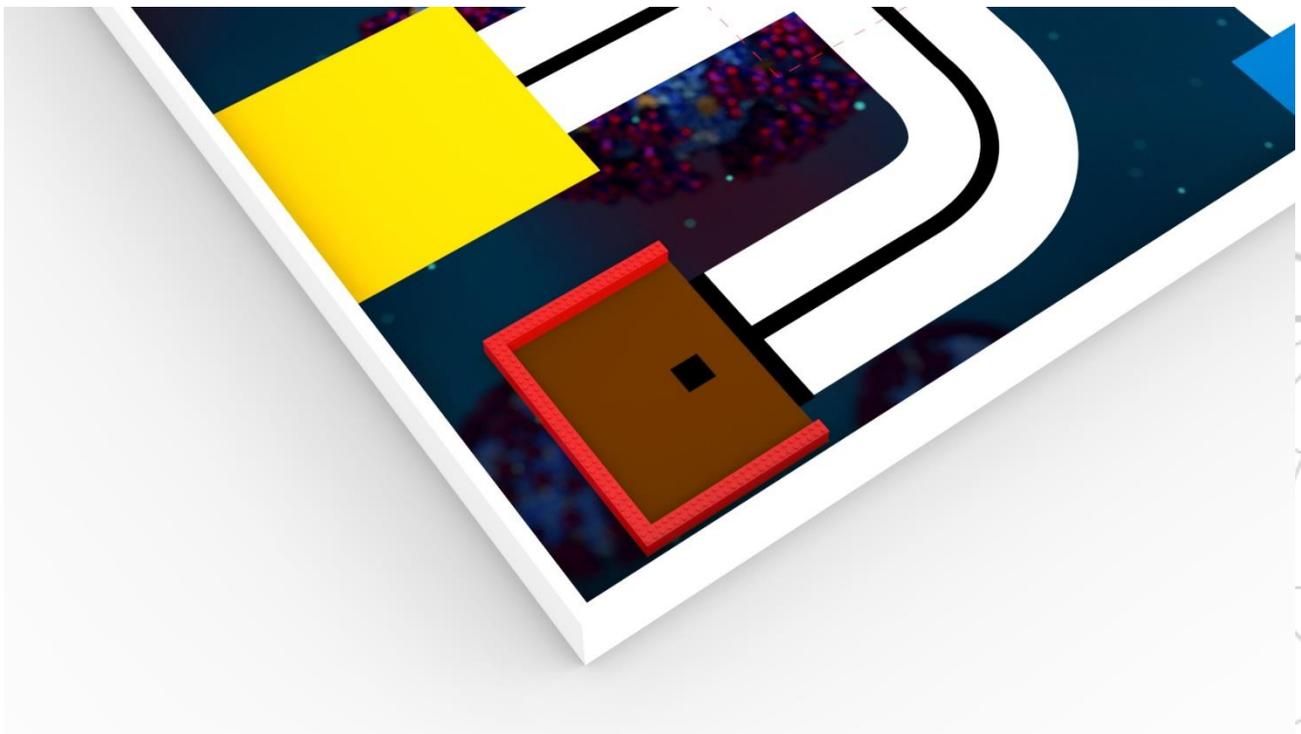
Based on the Playfield Map released thus far, the robot should be able to accomplish the following:

1. Spin inside the Centrifuge.
To achieve this, robot must enter the centrifuge and rotate on the spot for 3 full turns while staying completely inside the circle.
2. Deliver the Vaccine in the Freezer room for storage (Blue Zone).
3. Avoid bumping into the Laboratory Wall during the mission.
4. Return to Yellow Zone to end the mission.

Note: These are not the full details of the competition. The full details will only be released during the competition itself.

LABORATORY WALL

A lab wall will be placed inside the Brown Zone. The Lab Wall will surround the exterior of the brown zone except for the entry area. If the Lab Wall is partially outside the Brown Zone, that means it has been knocked into and will incur a penalty.



COMPETITION RULES

General:

1. During the competition, all teams must look after their own personal property, team construction and materials. Any member(s) of the competition who are caught in the act of sabotage, theft or mischief, whether to cause harm to other participating teams or not, will be dealt with by the competition organisers and their teams may be subject to disqualification.
2. No external help is to be rendered in this competition. This includes receiving direction, contribution, construction of any kind from the team mentor or any party or person not registered as a member of the team. Failure to comply with this rule will be dealt seriously and may result in the team's disqualification.
3. Teams should prepare and bring all the equipment, software and portable computers they need during the tournament.
4. Testing playfields will be set up for practice prior to the competition. Teams will queue up in an orderly manner and to refrain from hogging the playfields.
5. All decisions by the competition officials and organising parties are final.

Parts and Size Restrictions

1. Teams are expected to bring their own LEGO® Spike Prime, EV3 or NXT sets, batteries and laptops.
2. The robots must use parts solely from LEGO® Sets. Teams are allowed to use only one controller (Spike Prime, EV3 or NXT). The number of motors or sensors is restricted only by the number which the controller/brain can handle (Eg. 4 Motors and 4 Sensors for EV3, or 6 motors/sensors for Spike Prime). Multiplexers will not be allowed. The number of parts is not limited as long as they are LEGO® parts.
3. Mixing of parts from all 3 platforms (NXT / EV3 / Spike Prime) is allowed.
4. Robots will be inspected before each run. Teams with parts which do not comply to the rules will be disqualified.
5. The size of the robot and its extension as a whole will be strictly limited to **250mm x 250mm x 250mm.**
6. No form of remote control or wireless programming is allowed during the course of the run of the robot.
7. Only NI Labview, Robolab™, LEGO® Mindstorms® EV3, NXT, EV3 Classroom or Spike Prime programming platforms are accepted.

Game Play Rules

1. Each team will get 2 competition runs. Each run will have a maximum of 2 minutes. At the end of 2 minutes, the referee will call 'Stop' and the score will be counted.
2. The higher score of the 2 runs will be taken as the team's overall result. In case of tie in scoring, the run time of the best run score, followed by the lower score will be used as a tie breaker.
3. Strictly no restarts are allowed for both runs.
4. When a robot is tasked to start from a coloured zone, pause in a coloured zone, or end in a coloured zone, the robot and all its parts must fit entirely inside the coloured zone.

Operational Rules

1. Once the competition preparation time is over, no further work or modifications may be done to the robot.
2. Failure to quarantine the robot by the stated time will result in disqualification.
3. During each run, only a maximum of two members of each team will be allowed in the designated playfield area as designated robot operators.
4. During a run, only the designated robot operators may operate the robot.
5. A re-run may be held if the robot cannot complete the course due to an outside interference, such as a referee accidentally obstructing the path of the robot, or collision with a robot from a neighbouring playing field. A re-run may also be held if a malfunction of the playing field occurs.
6. To request a re-run, the designated robot operator must notify the referee before leaving the playing area. **Battery failure will not be a valid reason for rematch.** Durability of a team's robot will not be a valid reason for a rematch. Teams will be entirely responsible for ensuring that the robot is in full working order before the run.
7. Robot must be activated manually via NXT/EV3/Spike Prime screen options. No form of wireless programming or operation is allowed during the 2 competition runs.
8. The Referee will start the time as the robot is exiting the start zone and will automatically stop the time when robot is entirely within the ending zone. At any time during the mission, robot operator(s) may signal the Referee to stop the time with an upraised hand combined with the verbal signal "Stop". The timer will be stopped and points will be counted up to the moment where the signal to stop was clearly given.

Violations

1. The Referee(s) have the ultimate authority during the competition. Their decisions are final. Referees will not review recorded replays after a match is completed.
2. If a referee disqualifies a team, the robot is turned off for the remainder of the match and will not score any points for the match.
3. A team may not win a match through an advantage gained by breaking a rule, even accidentally.
4. If one team intentionally damages another team's robot they will be disqualified. If the damaged team's robot is considered poorly built due to a decision flaw, the other team may not be disqualified. The ultimate decision lies with the Chief Referee.
5. Deliberately damaging the playing field, robot, or altering the LEGO® pieces is strictly illegal and will result an immediate disqualification.
6. Team members, except for the operator(s), are not allowed in the designated playing area until the referees have completed the scoring procedures.
7. Team members must not interfere or assist the robot in any way during its run. No wireless robot communication is allowed during the 2 competition runs. Teams found in violation will be immediately disqualified.