EDU ROBOTICS CUP

organized by **EDUTUS UNIVERSITY**

2025

Engineer Challenge

MASTERS GAME RULES

Edu Robotics Cup

2024-2025

Engineer Challenge - Masters Rulebook

Rescue Mission

1. We are preparing a rescue mission into space to assist a crew of astronauts, who are stranded in a malfunctioning spacecraft. Time is the biggest pressure as the situation critical: air, water, and food are running out.
   Our task is to find a reasonable solutions to address the situation and support the ground unit's preparation for the rescue operation. Now it's your turn to leverage your creativity and technical skills to create the tools and strategies necessary for a successful rescue mission. You have 2 minutes to complete every task.

2. **Game Mat**
   Below you can see the game mat:

3. **Game Objects**

   Lego mini figures
   (only head + body + legs, no other accessories allowed)
   Amount: 4
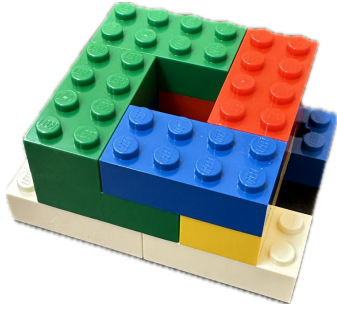   Size: standard Lego mini figure

   Lego Spaceship parts (2x4 lego bricks, any color accepted)
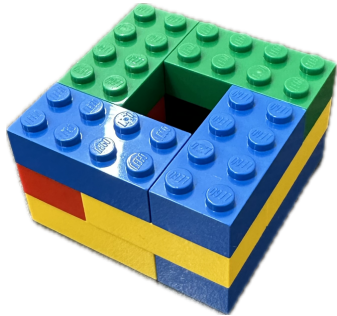   Amount: 38

   Lego Spaceship parts 2 (2x2 lego bricks, any color accepted)
   Amount: 4

- External Fuel Tank:

- the Solid Fuel Booster Rocket:

- Orbiter:

Soda can
Amount: 1
Size: standard with base diameter 58 mm

Blue plastic bottle cap
Amount: 3
Size: standard size 23 – 28 mm diameter

Plastic bottle cap (any color accepted, except blue)
Amount: 3
Size: standard size 23 – 28 mm diameter

Ruler
Amount: 1
Size: 30 cm
Important: whenever a game object has to be placed on an area the bordering lines of the area are not considered part of the area. If there is no bordering line then the edge of the color of the area is considered the border.

4. Game Objects on the Game Field

See picture below where to place the different game objects:

In case of rule infringement: If a game objects is not placed on the game field in the correct position points for that object will not be awarded for the team.

5. Game Tasks

The robot has to start completely inside the island area in the middle of the game field marked with red line.

5.1. Build a Spaceship
Ensuring all components of the spaceship are in place is crucial for meeting mission requirements and achieving successful assembly for launch.
Goal: Bring the z External Fuel Tank, the Solid Fuel Booster Rocket and Orbiter to touch the Spaceship graphic or/and the area marked by the white-black line.

5.2. Cargo
Collecting the designated cargo is essential for the mission's resource needs, enabling the crew to survive and complete their objectives in space.
Goal: All Cargo elements (Water, Air, Food) are touching the area bordered by a blue line in the top right corner of the field: including the spacecraft and the black-white line next to it..

5.3. THE CREW
Having the astronaut crew in the target area demonstrates successful preparation and readiness for this space operation, which is critical for the mission's success.
Goal: The astronaut crew is waiting at the farm area in the bottom right corner of the field bordered by the blue line. NOTE: in this case the black-white line crossing the area is NOT considered as part of the target area! The astronaut is touching the target area.

5.4. Parking
You can park the robot at the university building, points are awarded if the robot is at least touching any part of the building. Points are only awarded if any other points are achieved by the team from tasks 5.1. - 5.3.

6.   Scoring

Tasks	Score
Build a Spaceship	
External Fuel Tank: Only touching the target area in the top right corner of the field bordered by the yellow line (spaceship and black-white line included) and/or any other spaceship part.	**10**
Solid Fuel Booster Rocket: Only touching the target area in the top right corner of the field bordered by the yellow line (spaceship and black-white line included) and/or any other spaceship part.	**10**
Orbiter: Only touching the target area in the top right corner of the field bordered by the yellow line (spaceship and black-white line included) and/or any other spaceship part.	10
Additional **Assembly: All components are on top of each other in the following order (Lvl 1 External Fuel Tank, Lvl 2 Solid Fuel Booster Rocket, Lvl 3 Orbiter)**	10
Cargo	
Must only be touching the target area in the top right corner of the field bordered by the blue line (space center and black-white line included).	
Water Cargo(3 pieces)	**10/cargo**
Air Cargo (1 pieces)	30/cargo
Food Cargo (3 pieces)	10/cargo
Crew	
The astronaut crew is waiting at the farm area (located in the bottom right corner, marked on the map; the white-black line does not count). The astronaut is touching the target area. **Very important: Only the "Build spaceship" and "Cargo" scores are multiplied; all other scores are added together.**	**0.5 multiply/ crew member**
Additional - Efficiency Points	
Every 10 seconds saved earns 5 points (this is only achievable if at least 2 astronauts are in the target area, at least one piece of each type of cargo is in the target area, and all components of the spaceship are also in the target area). Very important: Maximum 30 points can be achieved	10 sec/5 points
Parking	
Robot parked touching the University area (Building with Edutus Logo)	**20**
Technical points	
Recorded and uploaded video includes all requested parts: ● robot, ● game field and game objects, ● robot run, ● end position of robot and game obejcts.	**10**
The team uploaded only one video file and one program documentation, which apply to the requested format and naming format.	**5**
Total score	**325**

6.1. Definitions for scoring

Completely inside: every part of the game object that touches the game field only touches the target area not including the surrounding line.

Touching: the game object touches the target area not including the surrounding line. Important that in this case the game object is not completely inside the area, because that is a different case.