



ENGINEERS OF FUTURE

CATEGORY

FINAL STAGE RULES

BAKU 2025

Introduction

In the "SAF-2025" "Engineers of the Future" category, students will be given the opportunity to both demonstrate and develop their skills. In this category, with the help of Vincibot robots, young engineers will use critical thinking, creativity, and problem-solving skills to find solutions to the assigned challenges. They will first analyze the problem and then present solutions using coding and robotics technology.

Participation in this competition is an excellent tool for students to develop their creativity, logical thinking, and programming skills. The goal of the competition is to program the Vincibot robots in a specific way and ensure they complete the given tasks.

This category encourages important skills such as coding, logical thinking, problem-solving, and the 4Cs (creativity, critical thinking, communication, collaboration) in students from an early age. It also supports the spirit of research and creativity, helping participants learn about robot technology, strengthen their knowledge, and develop engineering thinking.

1. Participation terms

- 1.1.** Each team must consist of 1 team leader over 18 years of age and 2 participants only between the ages of 8-10.
- 1.2.** Each participating team must have its own robot.
- 1.3.** Participating teams are considered to have accepted all changes made by the SAF-2025 Scientific Committee and all the terms specified in the rules.

2. Attention

- 2.1.** Participating teams must adhere to the spirit of competition, refrain from arguing or insulting others, avoid physical confrontation, creating provocations, or causing harm to other teams' projects, and should not take others' items without permission. Penalties for non-compliance with the rules will be applied based on the severity of the misconduct in the arena.
- 2.2.** Participating teams must be aware of safety and should not engage in behaviors that threaten the safety of their own team or other participants. They must inform the responsible persons for each category when using electrical sources. The use of open flames and bringing dangerous items into the competition area is also prohibited.
- 2.3.** Team leaders and accompanying members are not allowed to enter the competition field, nor are they allowed to intervene in the game from outside the competition area. If the team leader or accompanying person provides any form of support to the team or interferes with the games of other teams, the referee has the right to issue a warning, disqualify the team, and impose other penalties.
- 2.4.** Each participant is limited to competing in one category. Duplicate registrations, fraudulent registration, falsification of the participant's age, unauthorized alterations to competition participants, etc., are strictly prohibited. If such actions are discovered and confirmed, the participant will be disqualified.

2.5. In the event of unforeseen circumstances not covered by the rules, decisions will be made by the coordinators.

3. Application method

3.1. Applications will be accepted through SAF's official website (<https://saf.steam.edu.az/en>).

4. Final stage

4.1. General Information

In this competition, teams will attempt to complete certain tasks with their Vincibot robots. The goal is to transport oil barrels to the bunker and turtles to the island. The teams must do this within a set time and in a fully autonomous manner.

4.2. How should robots operate?

- Each team will use only one Vincibot robot. The robot must be programmed before the competition starts. No changes can be made to the robot once the competition begins.
- It is strictly prohibited to use a remote control or a computer to operate the robot. The robot must function autonomously.
- The robot must have mechanical arms made from its parts. These arms will be used to move the oil barrels and turtles.

4.3. What does the competition field look like?

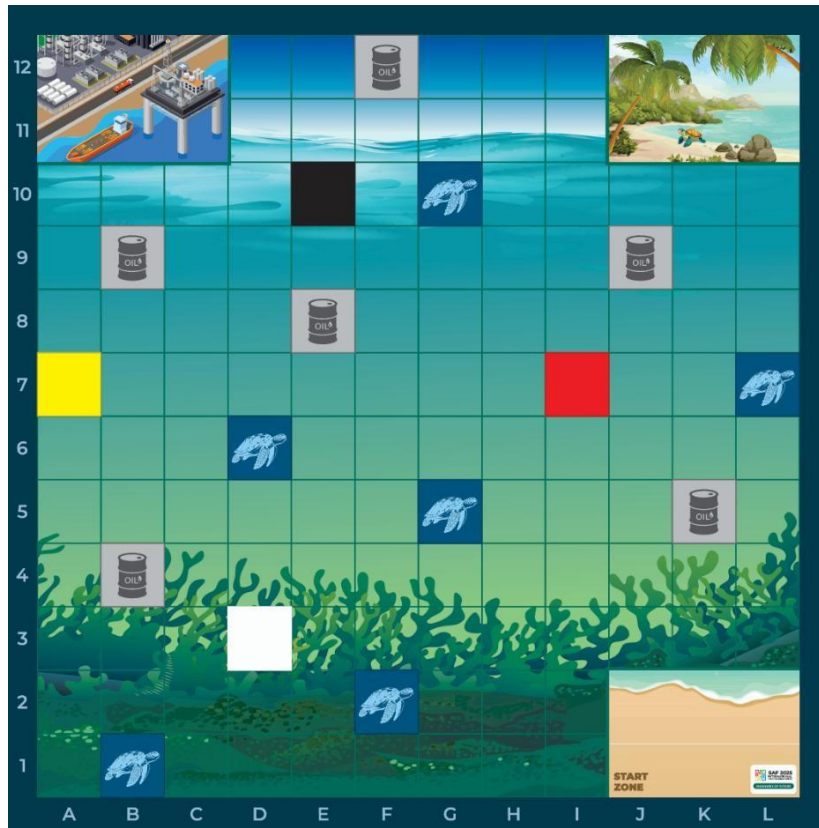
- The competition will take place in an area measuring 130 cm x 130 cm.
- The oil barrels and turtles will be placed in specific locations on the field before the competition begins.
- The bunker and island will be clearly marked on the competition field.

4.3.1. Scoring System for the Robot Competition

After the teams approach the competition table, the robots will be inspected by the judges. The dimensions of the robot, including the arm, must be a maximum width of 14 cm and a length of 15 cm. A robot that fails the inspection will not be able to compete in that attempt. At this point, the team must make adjustments to its robot again and wait for the next attempt to arrive.

- **Before the start**, each robot must be stable in its starting area. The initial direction of the robot may vary depending on the team's strategy.
- **On the competition field**, the robot must autonomously transport the turtles and oil barrels to the island and bunker, respectively, using its arms.

- **At the end of the competition**, points will be calculated based on the number of objects in the island and bunker areas.
- **Turtles:** Each is worth 10 points.
- **Oil Barrels:** Each is worth 5 points.
- Tasks completed using the **color sensor** will be evaluated as follows: 1 color = 5 points.



5. Evaluation criteria

5.1. Teams will be evaluated by the judges based on the following criteria:

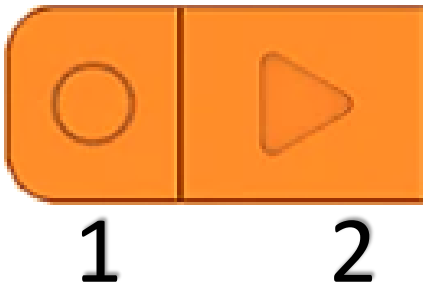
- **Programming Logic (20 points)**-The code should be structured and logical
- **Creativity and Strategy (10 points)**-Innovative approach to problem solving, optimality
- **Teamwork skills (10 points)**-Coordination of team members
- **Design and Creative Solutions (10 points)**-Design of robot's arms and mechanism

5.2. The points obtained during the competition will be added to the points obtained during the jury evaluation. If two or more teams show the same result, the points obtained in their other attempts and **the time taken to reach this result will be taken into account.**

5.3. If the robot fails to complete the task, i.e., it remains in a certain part of the field at the end, or if it fails to reach the START point, then the participants are prohibited from touching the robot. Teams that fail to reach the START point will have 5 points deducted from the final score for that attempt.

6. Competition format

- 6.1.** Each team is given 90 seconds for 1 attempt.
- 6.2.** The robot's movement must be ensured solely in an autonomous manner.
- 6.3.** Objects must be moved to the destination point using the arms. The robot can only move 2 objects to a destination point at a time, i.e. it is forbidden to pick up more than 2 objects between the arms. The robot must move on the map.
- 6.4.** When the race starts, the robot cannot be controlled by any external means. The START command must be given to the robot using the 2 buttons on the robot.



1. **It will be used to transport oil barrels to their destination.**
2. **It will be used to transport the turtles to their destination.**

6.5. Tasks performed with the color sensor

- The robot must pass over at least 1 color while moving objects to the destination.
 - The color must be read by the color sensor on the robot.
 - When the color sensor reads the color, it must be visible on the robot's screen by blinking its eyes.
 - Colors passed without being read by the sensor are not scored.
 - The robot can only get points once for each color, and if the same color is read again, the score is not calculated for this color again.
- 6.6.** "If the provisions of paragraph "6.5" are not implemented, all points earned on that roadmap will be considered invalid.
- 6.7.** The robot cannot be touched while in motion. A participant's interference with the robot can occur when the robot correctly completes and completes the first task and reaches the final destination point. When the second task is to be completed, the team member waiting at the FINISH point can manually send the robot to the team member waiting at the START point.
- 6.8.** If the robot cannot complete the task, that is, if it remains in a certain part of the field, then the participants are prohibited from touching the robot. The robot can be brought to the START point by the judges.
- 6.9.** Only the robot's arms can be made from Lego plastic parts (it is forbidden to use Lego motors, hubs, and other electronic components), while the other parts can be made using Matatastudio kits (Inventor, Creator).
- 6.10.** Each team is given 2 attempts. Whichever of the two attempts has the higher score, that point will be recorded on the team's account.

What is prohibited?

- ⚠ It is forbidden to touch or control the robot from the outside during the competition!
- ⚠ The robot must not use the walls, boundary lines, or outer structures of the field for any physical support when carrying objects.
- ⚠ Team members cannot take the robot outside the competition area.
- ⚠ The robot must not intentionally touch or obstruct other robots.
- ⚠ If a team violates the rules or the robot operates with external interference, that team may be disqualified from the competition.

NOTE: In case any changes are made to the rules by the organizing committee, the information will be provided on the website <https://saf.steam.edu.az>.