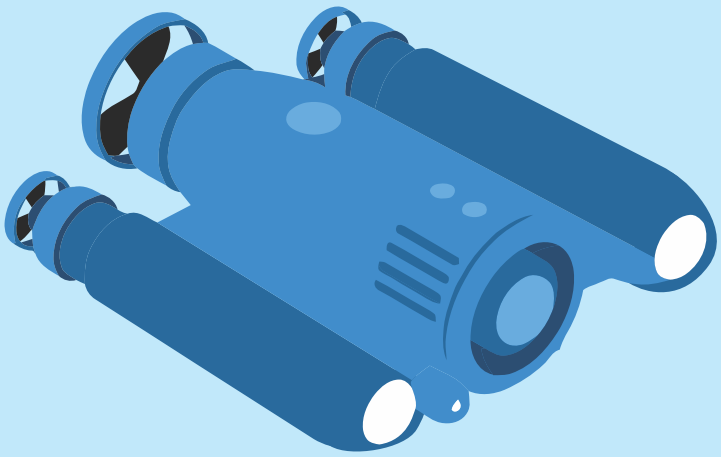
STEAM AZERBAIJAN

SAF 2025 INTERNATIONAL
STEAM AZERBAIJAN FESTIVAL



DEEP DIVE

CATEGORY

FINAL STAGE RULES

BAKU 2025

1. Introduction

1.1. The Eco Dive underwater competition encourages young people and technology enthusiasts to learn and use STEAM knowledge, experiment with artificial intelligence, explore the working principles of future technology, develop engineering practices and independent thinking.

1.2. The main reason for the application of this technology in underwater areas is to protect natural resources and ensure the country's underwater security. A significant amount of recent academic and industrial research has focused on the study of unmanned vehicles in underwater work due to the lower costs and risks.

1.3. In line with this need, our goal is to play a leading role in the development of this field by giving teams tasks related to scenarios and testing how they will perform, encouraging the deployment of underwater vehicles capable of remotely controlled or autonomous missions to a wider base across the country.

2. Application Method

Applications will be accepted through the official website of SAF. (https://saf.steam.edu.az/)

3. Terms of participation.

3.1. In accordance with the rules given in the "Deep Dive" competition, the teams will prepare and exhibit a ship, and in the final, underwater devices will be competed.

3.2. Teams must consist of 1 team leader over 18 years old and 3 participants between 13-26 years old. Each team member can join a maximum of 1 team.

3.3. If the participant has previously participated in another competition with his project, all details of the project he participated in (date, place, organizer, result) must be submitted to the organizers.

3.4. Only one competition can be applied for with the same team. Applications from the same team or individuals applying for different categories of SAF-2024 will be considered invalid.

3.5. Participants must follow all rules. The referee will impose a 10-second penalty on the first offense, and if this happens more than once, the referee may deduct 10 points from the team or disqualify the team.

3.6. Participating teams must arrive at the venue of the competition at least 5 minutes before the start of the competition. If 3 players of the team have not arrived 5 minutes after the start of the competition due to reasons such as delay or inability to pass the inspection, the referee determines that the non-participating team has lost the competition and evaluates the total score for that stage as 0.

3.7. If there are reasons such as delay or failure to pass inspection in the first round, they can participate in the Second round if they are ready within the specified time before the start of the Second round and their ships pass the inspection.

3.8. Participating teams must respect the spirit of competition, do not argue with others or insult them, do not cause physical confrontation or provocation or damage the ships of other teams, do not take their belongings without permission. Penalties for noncompliance should be commensurate with the severity of the misconduct in the arena. If during the race, inadvertently or due to technical reasons, a ship collides with another and any of the ships is damaged, this will not be considered a violation, it will be considered an engineering error and the game will continue.

3.9. Participating teams must be safety aware and not engage in behavior that threatens the safety of their team or other employees. Illegal use of electric lanes, use of open flames and bringing dangerous objects into the competition venue are also prohibited.

3.10. During the competition, team leaders and team escorts are not allowed to enter the competition field, interfere with the game in any form from outside the competition area. If the head of the team or the person accompanying him supports the team and interferes with the games of other teams, the referee has the right to warn, disqualify the team and impose other penalties.

3.11. Each contestant is limited to competing in one category. Duplication of the competition, false registration, misrepresentation of the age of the contestant, unauthorized change of contestants, etc. is strictly prohibited. Upon detection and confirmation of the incident, the participant will be disqualified.

3.12. Participating teams are considered to have accepted the subsequent changes and all conditions mentioned in the rules.

3.13. In case of force majeure events not provided for in the rules, decisions will be made by the coordinators.

3.14. Team names participating in the International STEAM Azerbaijan Festival must not contain or refer to political, religious, military, or conflict-related themes.

4. Special cases

4.1. The main reasons for special circumstances are interruptions caused by venue staff, venue control, competition area or force majeure. After inspection and negotiations, the head judge can decide whether to hold a rematch or not.

4.2. No refunds will be made for any vessel malfunction or suspension (including but not limited to equipment failure or equipment communication failure).

4.3. Participants who cannot compete at the place of the competition due to their personal reasons or force majeure must inform the competition organizing committee in advance.

5. Selection stage

5.1. After the end of the registration, the selection stage will be held among the teams and the final teams will be determined. Selection is carried out in 2 stages:

5.2. In phase I, the participant registers and prepares a preliminary evaluation report on the ship project he wants to create. Content of the report:

- Information about the team
- Information about the project
- Electronics and circuit diagram to be used
- Scheme of the project
- 3D model of the project
- Explanation of the code's working logic
- Grave size (wide length and from the highest the longest measurement will be taken)
- Mass

5.3. The ship must be prepared in the dimensions given to the participants for the II stage within the specified time. The preparation process (safety rules must be followed during the process. If the submarine of the team is ready in advance, then it must explain the preparation process in the video), the watertightness test of the vessel, the ability to maneuver quickly and send a video while moving in the water (the video must be uploaded to the "YouTube" platform, in the video you must be informed about the project you are joining and information about joining the STEAM Azerbaijan project must be mentioned in the description of the video. Video duration must be maximum 90 Seconds, minimum quality must be 1080p).
Hashtags
The video must be shared on the YouTube platform with the following hashtags:**#deepdive, #deepdive25 #AROVC, #AROVC25, #STEAMAzerbaijan and #AzerbaijanROVChallenge**. The title of the video must be written in English and it must clearly include the name of the competition and the year.

Example:
AROVC 2025 – Team X – Test Video (Underwater Demo)

In the description section of the video, the hashtags mentioned above must be repeated, and the following keywords must also be included:
ROV test video, underwater robot Azerbaijan, student ROV competition, Deepdive, deepdive2025, rovazerbaijan, arovc, underwatherdronechallenge

Note 1: Organizers may involve their teams in the interview stage if needed. At this stage, the work of the team and the level of awareness will be evaluated.

6. Selection criteria

6.1. I stage on evaluation Note the tables below has been done. I stage on evaluation Note the tables below has been done (Evaluation by 3 judges will be conducted by If the size and mass are shown incorrectly during the evaluation, the points collected from the size and mass will be deleted accordingly).

6.2. I stage on evaluation Note the tables below has been done.

Criterion	Points
Report for phase I	0 - 100
Tank preparation	80
PCB board preparation (the PCB board must be designed in professional programs such as EasyEDA, Altium Designer, Upverter PCB**) and the circuit must be simulated**	40
Hydrodynamic testing of your ROV model must be carried out in programs such as Fusion 360, Onshape, SolidWorks	80
Development of the control software	40
Individuality	45
Emergency STOP preparation (Kill Switch **must immediately shut down the ROV motors)**	50
Connection of the BMS system (it must prevent the battery from dropping below 11.8V/22.8V)	100
Preparation of propellers	15
Preparation of the case	15
Preparation of the remote control	15
Preparation of the control panel	60
Total	Max 640

6.3. **Dimensions** (The longest dimension between width, length, height is the basis will be taken.)

Criterion	Points
Submarine ≤ 50 cm	50
50 cm ≤ Submarine ≤ 70 cm	30
70 cm ≤ Submarine ≤ 90 cm	20
90 cm ≤ Submarine	0

6.4. Underwater of the ship mass

Criterion	Points
Submarine ≤ 8kg	50
8kg≤ Submarine ≤ 10kg	30
10kgcm ≤ Submarine ≤ 15kg	20
15kg ≤ Submarine	0

6.5. II stage on evaluation Note the tables below has been done.

6.6. Creating video

Criterion	Points
Preparation process display	0 - 50
Audio description of the video	0 - 40
Learned during the process of knowledge celebration	0 - 90
total	Max 180

7. Final round (general information)

7.1. In the submarine competition, the participants have to perform the specified tasks in a short period of time by remotely controlling the camera.

7.2. Teams will be given 5 minutes of preparation time in each round to familiarize themselves with the competition area and test their submarines.

7.3. The final stage will consist of 2 rounds:

7.4. In the 1st round, the team must inspect the pipes installed underwater, detect the leaks, mark the leaking part and enter the finish zone within the given time.

7.5. In the second round, the teams will compete on a mutual cleaning mission. The team that cleans the most from the two teams that start the race with the start whistle will be the winner.

7.6. If there is a malfunction in the ship during the race, the team will be given 15 minutes once .

8. First round of the finals

8.1. In the first round, the teams will compete in competition area A (within 5 minutes). Participants can move the ships and complete the task only through the camera view.

8.2. Teams competing in the first round must conduct an underwater survey of the desired trajectory, detect leaks in the pipes and mark the leak point with a suitable marker (by placing a suitable element at the leak point). A matching tagging element should be detected by the AI and tagging the item on the screen. The teams will start the race with the "Start" whistle and finish the race by completing the tasks on the competition field within 3 minutes and entering the finish zone.

8.3. Timing for teams will be started with the "Start" whistle and will stop when the boat lands in the finish zone. Time is not stopped if a team stops their dive outside the end zone. If the boats stop during the race due to hitting the pipes or for any other reason, the competitor can start the boat again from the place indicated by the judge (some distance back from the point where the boat broke down).

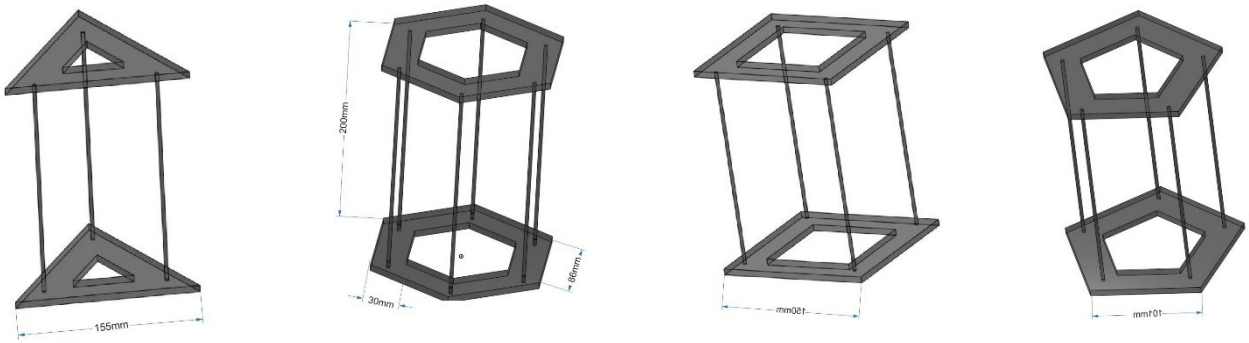
8.4. If it does not hit the underwater pipes and does not fall to the ground and continues to move, this is not considered a violation of the rule.

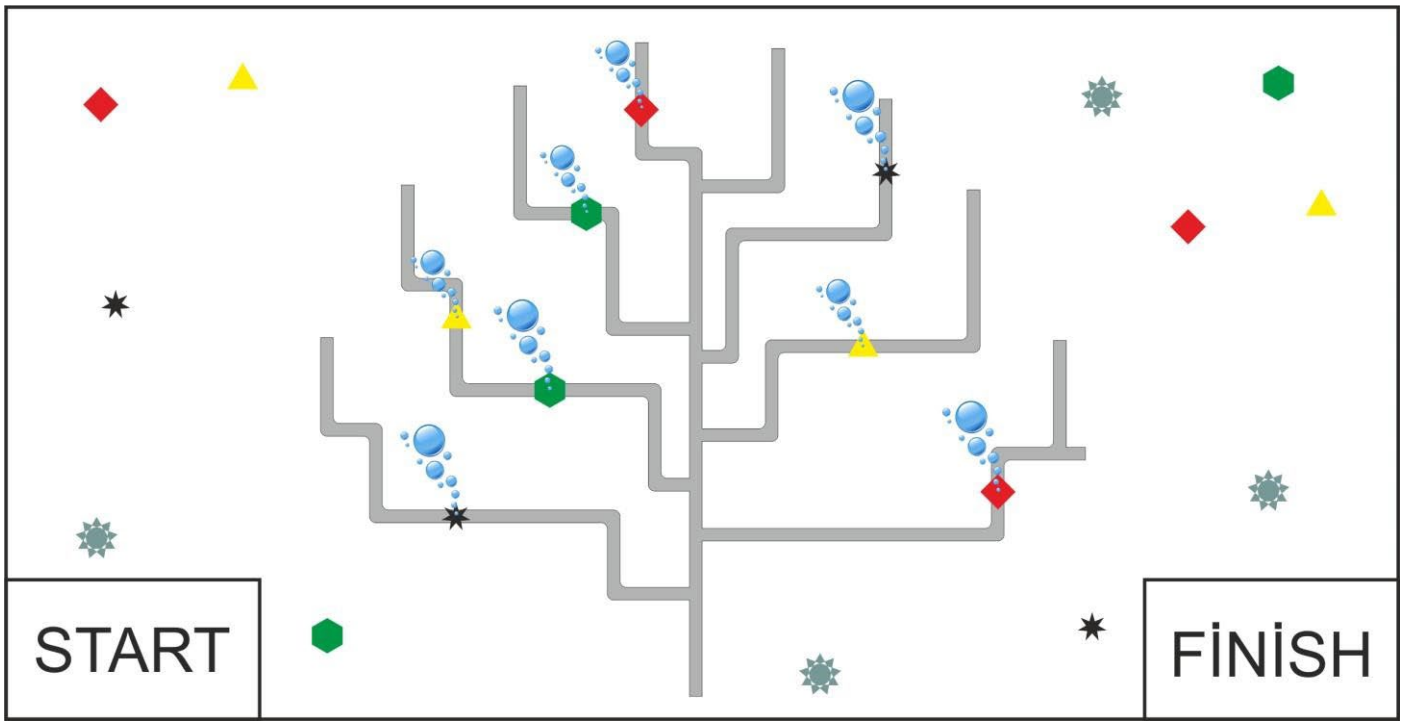
8.5. If the boat cannot go to the finish zone for any reason, the participants can stop the race at any place and time before the time expires. At this time, the points collected by the participants until that moment are added up, and the end time of the competition is marked as 3 minutes.

8.6. After the competition, the participants must sign the document with the points calculated by the judges.

8.7. A and B competition area is 4 meters wide and 8 meters long. The height of the competition area is 1.3 meters.

8.8 Holding elements to be used in the final stage





Picture - A racing field

9. Scoring (First round)

9.1. In the first round, as long as they find and correctly mark the leaks in the pipes (the corresponding marking element must be detected by the AI and mark the element on the screen), the team will earn points. If the AI does not see the tag element during the tagging, half of the tagging points will be credited to the team.

9.2. Table 1 - Scoring criteria for the first round:

Criterion	Points
start moving	30
Placing a marker element on a leak point (there will be 4 leak points)	20
Full descent	45
Incomplete descent	15
Total	Max 170

9.3. The points collected in the selection stage and the first round will be added together. According to the points, one team will take first place, one team will take second place, and two teams will take third place.

10. The second round of the final stage

10.1. In the second round, two teams will compete against each other by drawing lots. The team that clears the most will be the winner (teams must cooperate and strategize correctly). The race will not be stopped if, for any reason, the boats become entangled in the wires and their movement is restricted.

10.2. In this round, the mentioned teams have to complete the tasks in the competition area B with their submarines. Teams will start the race with the "Start" whistle and reach the finish zone to complete the tasks on the competition field within 5 minutes and finish the race.

10.3. Timing for teams will be started with the "Start" whistle and will stop when the boat reaches the finish zone. Time is not stopped if teams park their boats outside the staging area. At this time, the participant can restart the ship and move it. This is allowed 1 time.

10.4. Even before the end of the time, the participants can stop the race at any place and time. At this time, the points collected by the participants until that moment are added up, and the end time of the competition is marked as 5 minutes.

10.5. Each participant must land the boat in the finish zone. A vessel's points for the finishing zone will be determined according to whether the vessel is completely or incompletely in the finishing zone.

10.6. In the second round of the finals, the teams will compete according to the following structure.

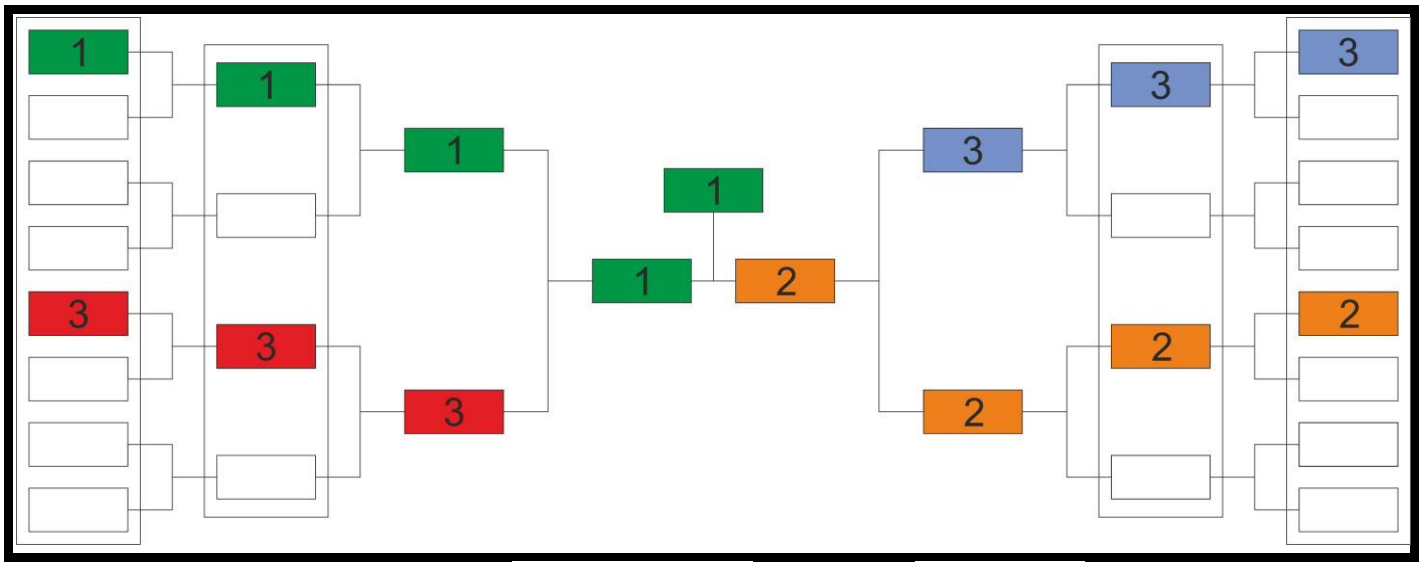


Figure 4. The structure of the race scheme

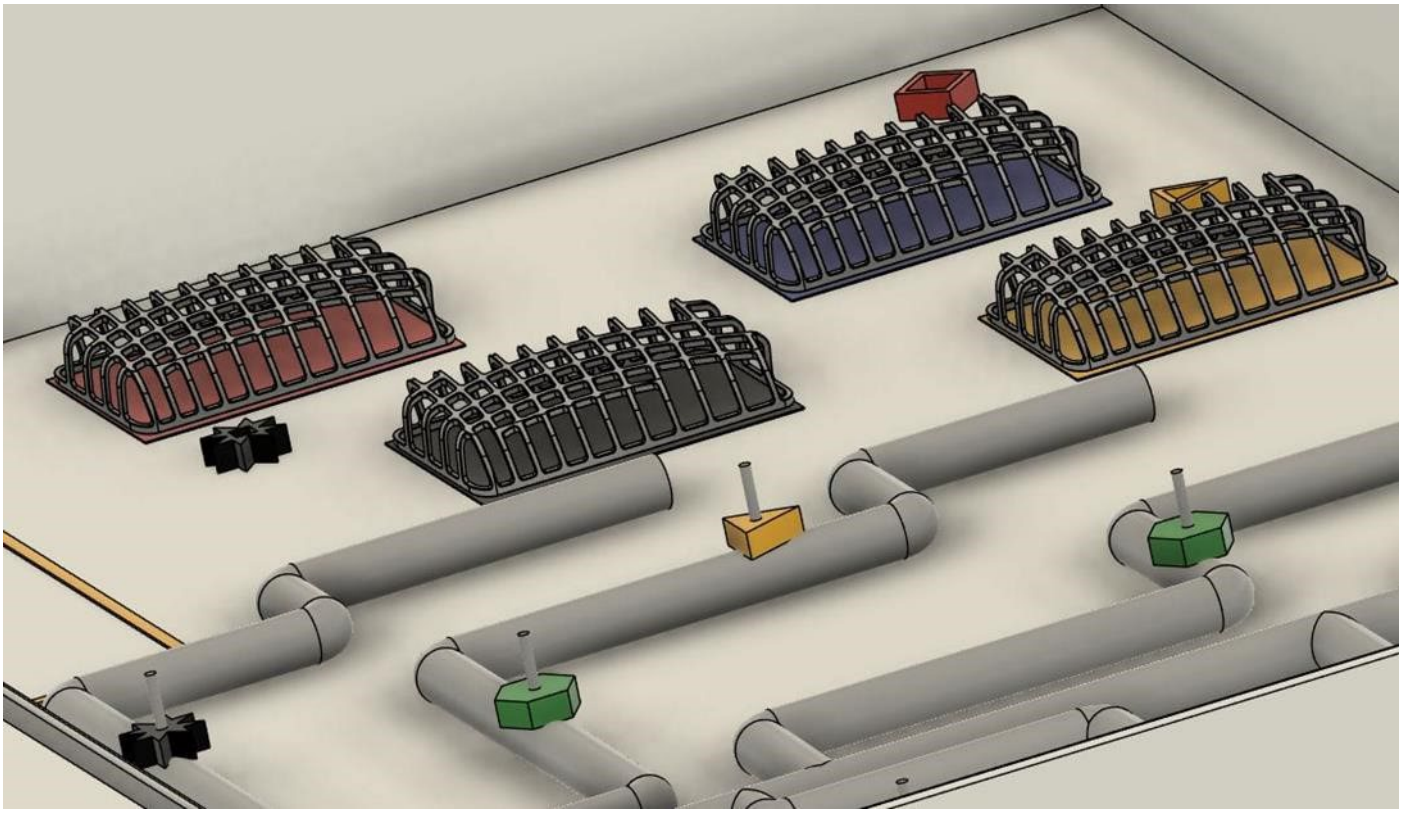


Figure 5. B racing field