INNOVATION AND ENTREPRENEURSHIP

CATEGORY

SELECTION AND FINAL STAGE RULES

BAKU 2025

Introduction

In the 21st century, students are acquiring knowledge and skills in scientific fields that are essential for the development of various sectors of modern society, thanks to the implementation of new approaches in education. As a result, a new generation is emerging—young people who can apply their knowledge and skills to solve real-life problems and contribute to society.

The "Innovation and entrepreneurship" category encourages the development of projects aimed at addressing technological, social, and environmental challenges of the 21st century through creative solutions. The primary goal of defining this category is to foster students' ability to solve real-world problems by turning their innovative ideas into practical projects through the use of modern technologies.

1.Strategic importance of the category for the future

- ➢ **A sustainable and technological future:** through this category, participants develop skills in innovation, artificial intelligence, smart systems, and eco-friendly technologies—core competencies required in the future labor market.
- ➢ **Foundation for economic and social innovation:** projects foster the growth of technological entrepreneurship within the country, encourage startup-oriented ideas, and contribute to the creation of future job opportunities.
- ➢ **Readiness for national and international competition:** youth trained in this field gain the foundational knowledge needed to participate in international competitions, scholarship programs, and global technology events.
- ➢ **Experience-based learning:** participants go beyond theoretical knowledge by gaining hands-on experience with platforms such as arduino, micro:bit, and others, as well as building prototypes.
- ➢ **Interdisciplinary approach:** in the process of developing projects, technology is integrated with biology, physics, chemistry, geography, computer science, mathematics, and social sciences. This promotes interdisciplinary thinking among learners.
- ➢ **Research and innovation skills:** during project development, students enhance their research capabilities, including problem analysis, hypothesis generation, testing, and data analysis.
- ➢ **Teamwork and presentation skills:** participants gain experience in working collaboratively, exchanging ideas, presenting their projects, and justifying their solutions.

2.Participation rules

2.1 Two age groups are defined for the "Innovation and entrepreneurship" category:
- ➢ Secondary school students: ages 13–17
- ➢ Higher education institutions: ages 17–25

2.2 Teams consisting of secondary school students **(ages 13–17)** must include a maximum of 2 participants and 1 mentor.

2.3 Teams from higher education institutions **(ages 17–25)** must consist of a maximum of 2 participants of them must be designated as the team captain.

2.4 A participant may only take part in one category and one team.

2.5 The involvement of mentors or captains is limited to a maximum of two teams within this category.

2.6 The names of teams participating in the International STEAM Azerbaijan Festival must not reflect political, religious, military or conflict themes!

3. Participants' behavior rules

3.1 All teams taking part in the event must follow the principles of fair competition. They should not argue with other participants, insult anyone, or act in a provocative or aggressive way. Teams must not damage other teams' projects on purpose or take their belongings without permission. If any of these rules are broken, penalties will be decided based on how serious the violation is.

3.2 Participants should also be aware of safety rules and avoid any behavior that could put themselves or others at risk.

3.3 During the competition, team leaders and accompanying adults are not allowed to enter the competition area or interfere in any way. If a leader or chaperone tries to support their team unofficially or disturb other teams, the referee has the right to give a warning, disqualify the team, or apply other disciplinary actions.

3.4 Each participant can only compete in one category. It is strictly forbidden to register more than once, use fake registration information, give false age information, or switch participants without permission. If any of these happen and are confirmed, the participant will be disqualified from the competition.

3.5 If something unexpected happens that is not covered by these rules, the organizers will make the final decision.
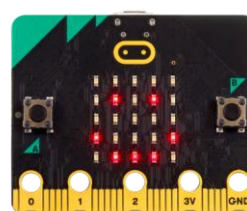
4. Application procedure

4.1. Applications will be accepted through the official website of the International STEAM Azerbaijan Festival **https://saf.steam.edu.az/az**.

5.Technical requirements

5.1 At least one of the Arduino or Micro:bit platforms must be used in all projects submitted to the competition.
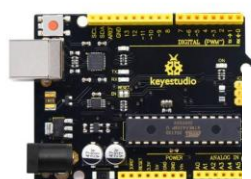
Arduino

Micro:bit

5.2 A project may include one or more Arduino or Micro:bit devices.

5.3 For the 13–17 age group, the main control part of the projects submitted by the teams must be based specifically on Arduino or Micro:bit. In addition, auxiliary technological elements (sensors, modules, etc.) are allowed.

5.4 In projects for the 17–25 age group, the choice of the main control platform is flexible, but at least one core functional part of the system must be implemented through Arduino or Micro:bit.

Technical functionality and applicability:

• Projects must not consist solely of decorative or theoretical models. Participants must present functional and operational systems.

• The main goal of the project should be to solve a real-life problem using technology and must include measurable and explainable technical functions such as control, data collection, processing, and response based on outcomes.

• The system's functionality must be implemented through sensors, actuators, software, and control mechanisms, and these elements should contribute meaningfully to the overall working principle of the system.

• Systems that only transmit power or provide visual effects (e.g., only lighting up, motionless, or unresponsive systems) will not be considered scientifically and technologically valid and will not be accepted.

Technological scope and additional tools:

• Participants may additionally use ESP32, Raspberry Pi, IoT modules and systems, artificial intelligence algorithms, sensors and mobile applications, Python programming language, and other modern tools.

• These tools must be used only as supportive technologies that serve the expansion of the project, and the main logical mechanism of the project must remain connected to the specified main platforms (Arduino or Micro:bit).

Project directions:

• Projects may belong to areas such as robotics, smart systems, energy and environmental technologies, smart agriculture, AI-based applications, social innovations, and other real application areas.

Reality and evaluation criteria:

• Projects must have the potential for practical application, must technically solve the described problem, and must be justified from an engineering perspective.

• Each project will be evaluated based on criteria such as functionality, safety, energy efficiency, interconnection of components, the logical structure of the algorithms used, and scientific justification.

• Projects that are at a mock-up level but do not demonstrate real technical functionality (e.g., simple lighting devices for demonstration, models, systems without mechanisms, etc.) will not be considered suitable for the competition and will not be evaluated.

6.Technological justification and applicability of the projects

6.1 Projects must not involve plagiarism and should reflect the creative thinking and original work of the participant/team.

6.2 The prepared prototype must be ready for presentation, meet the technical requirements, and function properly during the demonstration.

6.3 The maximum size of the project should not exceed 100x100x150 cm.

6.4 For the 13–17 age group, any supporting sensors and modules may be used during project development.

6.5 The use of flammable, explosive, or high-voltage materials during the presentation is strictly prohibited.

6.6 The submitted project must aim to solve a clearly identified problem within the specified thematic areas.

6.7 Safety measures must be taken into account in all submitted projects.

7. Sample topics for project development

A) Safe living

Technological solutions aimed at ensuring safety in everyday life:

- Safety systems for transportation and logistics (e.g., smart collision alerts, GPS tracking systems);
- Sensor-based monitoring systems for the safe storage of food products;
- Arduino/Micro:bit-based systems for secure data storage;
- Personal protection and self-defense devices (e.g., wearable gadgets with SOS buttons);
- Smart devices for children and the elderly that provide location tracking and send alerts in case of danger;
- "Smart" access control systems for homes and workplaces (biometric or rfid-based);
- Real-time alert systems for emergency situations such as fire, gas leaks, or medical emergencies.

B) Biodiversity conservation and restoration

Technology-based approaches for ecosystem protection and biodiversity sustainability:

- Sensor-based smart stations for monitoring rare flora and fauna species;
- Automated control and alert systems for nature protection zones;
- Analysis of animal movements and behavior monitoring using smart cameras;
- Soil, air, and water sensor networks built with micro:bit and arduino;
- Robotic planting and irrigation systems for ecosystem restoration;
- Ai-based forecasting systems for adaptation to climate change.

C) Green energy and sustainable development

Technological solutions supporting environmental protection and energy independence:

- Mini systems and modules powered by solar, wind, hydro, and biomass energy;
- Arduino-controlled "smart energy usage" systems (e.g., automatic energy saving);
- Recycling robots and sorting systems based on the "zero waste" concept;
- Platforms monitoring water, energy, and material usage (smart home/farm applications);
- Automated control systems for sustainable agriculture and urban greenery;
- AI-based data analysis and planning platforms supporting ecological entrepreneurship.

D) Artificial intelligence and data processing

Data analysis and decision-making systems using ai algorithms:

- Image recognition and object detection systems (tensorflow lite, edge ai);
- AI-based projects for voice, gesture, and motion recognition;
- AI systems for data collection and forecasting (e.g., weather prediction, energy usage);
- AI platforms that analyze environmental changes and provide alerts;
- Simple local AI model implementations on devices using Arduino and Micro:bit (e.g., teachable machine).

8. Presentation

1. Each team registered through the festival's official website must upload a video presentation (maximum 3 minutes) of their project, as well as a written presentation in pdf format, within the specified timeframe.
2. Both video and written presentations should clearly reflect the project's content, objectives, and the activities carried out during its development.
3. Video presentations must be delivered solely by team members. Mentors' participation in the presentation is prohibited according to the rules.
4. Teams that fail to upload both the pdf file and video link will not be allowed to proceed to the selection stage.

9.Selection stage

After the registration period on the festival's official website ends, a selection round will be held among the teams within the announced timeframe to determine the teams advancing to the final.

1. The selection stage will be conducted by judges based on the PDF files and video presentations uploaded to the website.
2. Project selection will take place before the festival, and teams successful at this stage will earn the right to participate in the festival.
3. The information presented in the video and PDF must correspond exactly to your project.
4. It is mandatory that the information expressed by team members during the presentation matches the project product's appearance; otherwise, this will negatively affect the evaluation.
5. The evaluation criteria for the selection will include the innovativeness, functionality, and uniqueness of the project topic, as well as presentation and entrepreneurial skills.
6. Projects that do not comply with the instructions and given conditions will not be allowed to proceed to the final stage.

10.Final stage

1. In the final, each team will present their projects at their assigned space (on a table);
2. During the festival, judges for each category will review every project and gather information from team members about the idea, functionality, development process, etc.;
3. Based on the collected information (including evaluation criteria), teams will be assessed.

Note: During the festival, participants may use personal laptops or tablets as auxiliary tools for their project presentations. It is mandatory for each team to prepare a promotional and informational roll-up banner for their project.

11.Evaluation of the selection and final stage

1. The projects will be evaluated separately for each age group (13-17 and 17-25 years) based on the criteria listed below;
2. According to the evaluation results of the final stage, teams will be awarded 1st, 2nd, and 3rd places;
3. In addition, teams will be recognized and awarded in various nominations (to be announced before the festival).

The evaluation of the projects will be conducted by the judges based on the criteria listed in the table.

Evaluation Criteria	Description of the Criterion	Point
Innovation and uniqueness	The project is based on a new and original idea; implementation of technological innovation and creative approach	20
Functionality and technical Implementation	The prototype or model is in working condition; efficient integration of technologies used (Arduino, Micro:bit, etc.)	20
Entrepreneurship and financial literacy	Evaluation of the project's business potential, presence of a basic business plan, assessment of funding opportunities, market entry and marketing perspective	20
Presentation and team skills	Clear, structured, and fluent communication of ideas; tone of voice, body language, eye contact, and team collaboration	15
Scientific-technical justification and real-world application potential	The project is based on scientific principles, applicable to real life, with social and environmental contribution	15
Design and neatness	Aesthetic appearance of the device or prototype, quality of technical assembly, and safety compliance	10
Total		**100**

Note: Teams that do not comply with the rules and guidelines established within the festival will not be allowed to be evaluated by the judges and will be removed from the venue.