DIRECTORATE GENERAL OF VOCATIONAL AND TECNICAL EDUCATION

18th INTERNATIONAL MEB ROBOT COMPETITION

RC FIXED-WING AIRCRAFT CATEGORY GUIDE

INTERNATIONAL MEB ROBOT COMPETITION

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RC FIXED WING AIRCRAFT CATEGORY COMPETITION RULES

1. GENERAL INFORMATION ABOUT THE COMPETITION

1.1. Purpose

Fixed-wing unmanned aerial vehicles are of strategic importance in today's aviation applications due to their characteristics such as long range, high efficiency and mission continuity. The primary objective of this competition is to enable participants to gain knowledge and skills in fixed-wing UAV design, production, and flight operations; to provide them with the opportunity to gain practical experience in aviation-specific disciplines such as aerodynamics, structural design, propulsion systems, and flight control. Throughout the competition process, participants are expected to develop an engineering perspective, enhance their problem-solving and teamwork skills, and produce original fixed-wing solutions. Thus, the competition aims to contribute to the development of our country's technical capacity and human resources in the field of fixed-wing UAVs. It offers a learning and experience platform for young people who are interested in fixed-wing aircraft, want to learn about the design-production-flight processes, and aim to develop their theoretical knowledge through practical applications. In this respect, the competition aims to contribute to the training of qualified individuals who will be able to take on roles in fixed-wing UAV piloting and various engineering fields in the future.

1.2. Theme

Unmanned Aerial Vehicles (UAVs) are divided into three main groups based on their basic structure: Fixed-Wing, Rotary-Wing, and Vertical Take-Off and Landing (VTOL) aircraft. UAVs whose wings do not rotate or change shape to keep the vehicle in the air are called fixed-wing UAVs. Conventional aeroplanes fall into this group. Fixed-wing UAVs can remain airborne only if the aircraft is in constant motion to generate aerodynamic lift on the wings. The propulsive force enabling this movement is typically provided by: propellers connected to internal combustion engines or electric motors, micro jet engines capable of high RPMs, or electric duct fans. In electric motor models, the propeller's position can vary to provide thrust or pull. These positions can generally be seen in different configurations, such as at the front (pull), on the wings, or at the rear (push). In electric motor models, the position of the propeller can generally be front pull (a, b) and rear push (c), as shown in Figure 1.

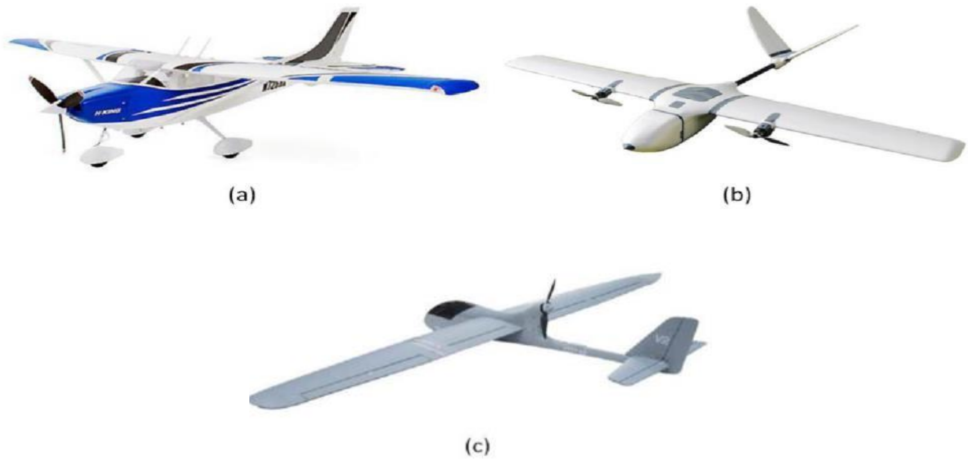

Figure 1. *Fixed-wing UAV Images: Front-Pull (a,b), Rear-Push (c)*

It should be noted that each fixed-wing design has advantages and disadvantages compared to other types of UAVs. Fixed-wing UAVs require large areas for take-off and landing. Fixed-wing UAVs have significantly higher flight ranges than rotary-wing UAVs. Rotary-wing UAVs are named according to the number of propellers (rotors) they have. These vehicles, which have one, two, three, four, six or eight rotors, are named Helicopter, Bicopter, Tricopter, Quadcopter, Hexacopter and Octocopter, respectively, from their Latin origins. In rotary-wing UAVs, the body is fixed and the propeller blades rotate, so there is no need for continuous movement to stay airborne, as is the case with fixed-wing UAVs. This makes the airborne and movement capabilities of rotary-wing UAVs more controllable; they can hover in a single point in the air and take off and land in very small areas. The main limitation of these types is their short flight range. Figure 2 shows rotary-wing UAVs with various numbers of propellers.

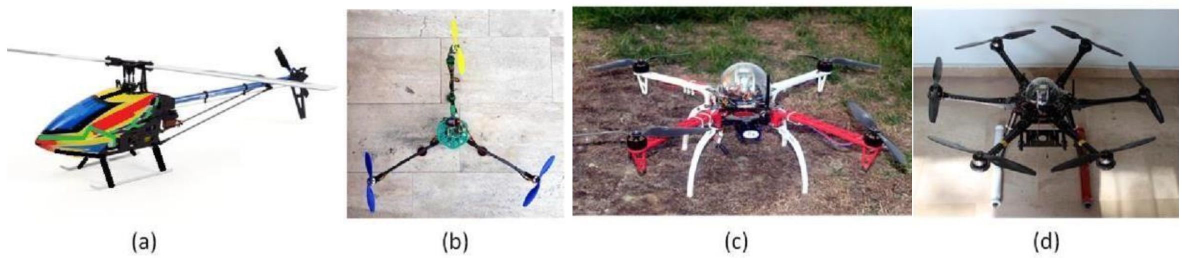

Figure 2. *Images of Rotary-Wing UAVs: a. Single-Propeller Helicopter, b. Three-Propeller Tricopter, c. Quadcopter with Four Propellers, d. Hexacopter with Six Propellers*

Another design type that has become popular and increasingly widespread in recent years is VTOL UAVs. (Vertical Take-off and Landing Unmanned Aerial Vehicle) Also known as VTOL (Vertical Take-off and Landing) in English, this design combines the long-range advantage of fixed-wing vehicles with the vertical take-off and landing capability of rotary-wing vehicles. VTOL UAVs will play an important role in the design of both manned and unmanned aircraft of the future.

In principle, a VTOL UAV has both rotary propeller systems that enable the vehicle to take off and land vertically, and fixed wings attached to the fuselage that enable it to glide and cruise. In this hybrid UAV model, there are various design approaches for different operational needs. Figure 3 shows various VTOL UAV designs.

Figure 3. *Different VTOL UAV Designs*

Only fixed-wing unmanned aerial vehicles may participate in the RC fixed-wing aircraft competition. Rotary-wing, VTOL (vertical take-off and landing), or hybrid aircraft with a fixed-wing/rotary-wing combination are not eligible for the competition.

1.3. Participation Requirements and Team Structure

The competition targets secondary school and university students interested in aviation and technology. Each team must consist of three students, including one student pilot and two assistant students, and one advisor teacher. Advisor teachers cannot support teams as pilots. Team students cannot provide pilot support to different teams.

1.4. The Critical Importance of Reading the Guidelines

The International MEB Robot Competition is a contest that brings together young talents' technical knowledge, engineering skills, and creativity.The RC Fixed-Wing Aircraft category expects participating teams to develop an **RC fixed-wing** robot that **is capable of manoeuvring in a specially prepared flight area, featuring an original design, locally**

manufactured, innovative, low-cost, easy to produce, with low empty weight, capable of high-speed flight ( ), able to successfully complete target-hitting tasks, and capable of stable and autonomous flight.

However, reaching the top in this exciting competition does not depend solely on the robot's physical strength or coding complexity. The real success of the competition lies in the robot's technical competence, along with the ability to carefully read and understand the guidelines covering rules and procedures.

The Application and Category Guidelines are more than just a technical guide; they are an integral part of the competition itself. Careful reading should be considered a fundamental skill of vital importance in modern engineering projects.

This is why:

The guidelines clearly define the technical constraints specific to the RC Fixed Wing Aircraft category, such as the robot's dimensions, weight, propulsion motor and electronic system limits. Failure to comply with these rules means disqualification from the competition, regardless of how well the robot performs.

The scoring systems outlined in the guidelines detail the order and precision with which tasks must be performed. Teams that thoroughly read the guidelines can optimise their robots according to a task strategy that maximises points and gives them an edge over their competitors.

As the competition process is dynamic, last-minute changes to the rules or applications may occur. Therefore, it is critical that competitors do not rely solely on their initial reading but regularly follow the announcements on the International MEB Robot Competition website and the content in the RC Fixed-Wing Aircraft category.

All teams applying to the RC Fixed-Wing Aircraft category of the 18th International MEB Robot Competition must read the Application Guide (accessible from the "Organisation" menu at https://robot.meb.gov.tr), which contains the competition applications and general rules for the category.

Understanding the guidelines is as challenging and important an engineering task as designing the robot. Meticulousness in this task is the first step towards success.

2. TECHNICAL SPECIFICATIONS AND CONSTRAINTS OF THE ROBOT

2.1. Dimension and Weight Constraints

The total weight of the UAV, including the tennis balls it will carry and all other equipment, must **not exceed 4 kg**. The UAV's compliance with this weight limit will be determined by weight measurement during technical checks prior to the competition. The UAV's body and wings must be **designed and manufactured** by the teams **themselves.** Commercially available UAVs that are found to be completely ready-made and the teams associated with them will be immediately disqualified from the competition. The UAV may take off by being thrown by hand and land on its body, or it may take off and land on the runway using a landing gear.

2.2. Hardware, Software, and Control Requirements

Only brushless electric motors may be used in the UAV. Propeller selection is at the discretion of the teams. Unmanned Aerial Vehicles (UAVs) cannot be monitored and controlled using FPV goggles or LCD screens. The use of OSD is prohibited. **The use of telemetry is mandatory for autonomous flight tracking in autonomous teams.** Teams must use encryption to prevent interference when using telemetry. Encryption is used to secure data communication between the UAV and the ground control station and to prevent unauthorised access or interference.

2.3. Detailed Description of Fixed-Wing UAVs

An RC fixed-wing UAV is an aircraft manufactured from lightweight and durable materials for the fuselage, wings, and tail surfaces, and controlled manually or autonomously by remote control. The design process focuses on aerodynamic structure, weight balance, and carrying capacity. The electric motor, propeller, ESC, and battery form the propulsion system, while servo motors move the control surfaces. The receiver, transmitter, telemetry, and flight control board are the basic avionics components.

3. COMPETITION AREA AND TASKS

3.1. Shape and Dimensions of the Competition Area

The competition will take place in an open area where the UAVs can manoeuvre comfortably. The task for all teams is to follow their own flight pattern, as shown in Figure 4, taking the two poles from the outside and dropping 2 (two) tennis balls, each weighing , from fixed-wing UAVs onto the specified targets. Flights by teams that do not pass around the poles will be invalid.

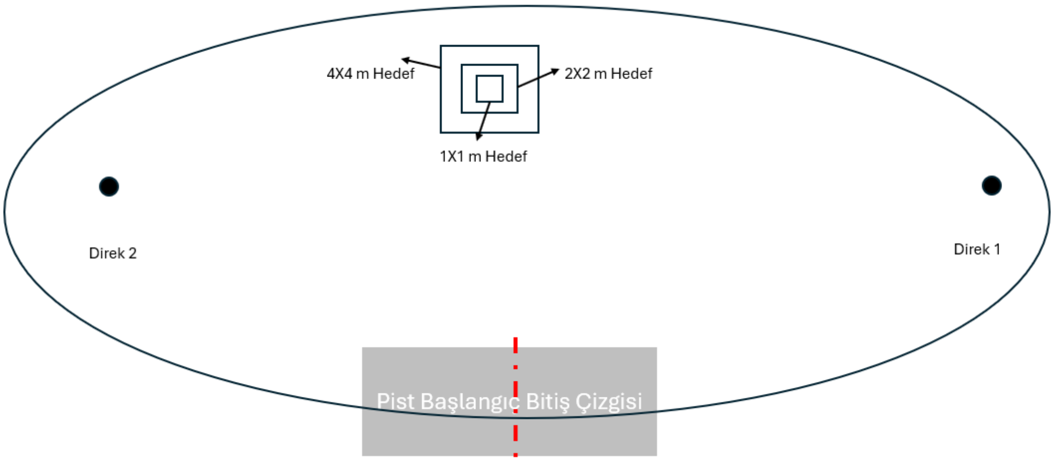

Figure 4: *Schematic representation of the task*

3.2. Ball and Mechanism Specifications

- The dimensions and weights of the tennis balls to be used are standard. The balls to be used for the task will be delivered to the teams prior to the flight.
- The design/manufacture of the release mechanism that UAVs will use to perform the task is at the discretion of the team and <u>must be an original mechanism.</u>

3.3. Ball Release Rules

- Teams cannot release two balls in the same flight. The release of balls must be carried out in different flight rounds.
- <u>**The point where**</u> the balls <u>**come to rest**</u>, not their initial point of contact with the ground, will be taken as the reference point. To this end, banners will be positioned slightly above the ground to prevent the tennis balls released from the UAVs from bouncing. To ensure the balls remain where they land, targets measuring 1x1 metre,

2x2 metres and 4x4 metres will be surrounded by 20 cm high strips. Despite the measures taken, teams have no right to object to the different scenarios that may arise on the field regarding the final position of the ball.

3.4. Criteria Affecting Scoring

- During the technical inspection phase, criteria such as Design and Originality, Localisation, Innovation, Cost-Effectiveness, and Ease of Production will be scored by the technical panel.
- Teams **cannot earn points for flight duration, empty weight, target accuracy score, stability, and autonomy, which** affect the flight score, unless they successfully complete their task. To successfully complete their task, teams **must drop both balls onto the target area and perform a flawless take-off, flight, and landing, even if they do not hit the target**.
- The team that develops the UAV with the lowest empty weight will earn more points.
- The team whose UAVs complete the flight task in the shortest time will receive a higher score.
- Teams with high target accuracy (targets measuring 4x4 metres, 2x2 metres, and 1x1 metres) will earn more points.
- UAVs that fly in a balanced and stable manner will receive higher points.
- UAVs that fly autonomously will receive higher points than those that fly manually.

4. COMPETITION FORMAT AND EVALUATION CRITERIA

4.1. Application, Video Report Process, and Preliminary Screening

- Teams invited to the competition will be asked to submit a video report on the production and flight of their aircraft. The video should include: proof of flight and mission execution, team introduction, technical specifications of the UAV, production stages, introduction of the mission mechanism, avionics hardware and software information, structural-propulsion-aerodynamic tests, and safety features of the UAV.
- The video length must be **at least 5 minutes and no more than 10 minutes**.

- Production videos are uploaded by teams to YouTube with the team name and competition category name. Links to the uploaded videos are added to a specific area on the registration system.

4.2. Pre-Evaluation Video Scoring Criteria

- Table 1 summarises the preliminary evaluation scoring criteria, with detailed breakdowns provided below.

Table 1: *Preliminary evaluation video scoring criteria*

HEADING	MAXIMUM POINTS
1. Flight and Mission Execution Evidence Video	50 Points
2. Team Introduction	5 Points
3. Technical Specifications of the UAV	5 Points
4. Production Stages	10 Points
5. Introduction to the Mission Mechanism	10 Points
6. Avionics Hardware and Software	10 Points
7. Structural, Propulsion and Aerodynamic Tests	5 Points
8. UAV Safety Features	5 Points
TOTAL	**100 Points**

- In the flight and mission execution proof video, the take-off, cruise flight and landing footage of the UAV expected to perform the above-mentioned mission must be uninterrupted and recorded without editing. Flight recordings must be made from a distance where the UAV's design can be clearly distinguished and at an appropriate resolution.
- The team introduction should provide information about the competencies and responsibilities of the team members involved in the design, production, and flight testing processes of the UAV.
- The technical specifications of the UAV should include dimensional measurements of the final design, details of the body and mechanical systems, and images of the front, right, top, and perspective views.
- Information should be provided on the production methods for the body and mechanical parts during the production stages and the efficiency of the production

process. Mechanical details such as flight control surfaces and landing gear should be explained, and the UAV's assembly processes should be presented with supporting descriptions and images.

- In the introduction of the mission mechanism, design and manufacturing visuals of the mechanism elements should be presented, and the mechanism should be demonstrated as functional by operating the UAV on the ground.
- Under the heading of avionics hardware and software, information regarding avionics and power systems such as the control card selected for the UAV's flight control, battery, ESC, RF transceiver systems, battery and power modules, as well as avionics hardware assembly processes, should be provided. If autonomous flight is to be used, information regarding the ground control station software should also be provided.
- Under the heading of structural, propulsion and aerodynamic tests, applications such as fuselage and wing structural strength tests, power consumption tests, propulsion tests, control surface ground tests, etc. should be included.
- Under the heading of UAV safety features, flight safety measures taken during assembly (part fastening, cable safety, vibration prevention, etc.) should be demonstrated and explained; in addition, the power cut-off button and fail-safe system to be used in the system should also be explained.

4.3. Competition Stages and Scoring Details

A team can earn a maximum of 25 points for the design and originality, localisation, innovation, economy and ease of production of their aircraft, a maximum of 10 points for flight duration, a maximum of 10 points for empty weight, a maximum of 30 points for flight mission performance and target accuracy, a maximum of 10 points for stable flight and a maximum of 15 points for autonomous flight.

- The scores received by the teams from the technical panel and the scores to be received from the flight mission are added together to determine **the 6 teams that will advance to the final stage**.

4.4. Competition Scoring System and Evaluation

Table 2 summarises the competition area scoring criteria, with detailed breakdowns provided below.

Table 2: *Summary table of competition area scoring criteria*

Criterion Heading	Point Explanation	Points
Technical Inspection	Design and Originality	0-5 Points
	Localisation	0-5 Points
	Innovation	0-5 Points
	Cost-effectiveness	0-5 Points
	Ease of Production	0-5 Points
Flight Duration	10. Calculated using the formula: $\frac{t_{min,uçuş\ süresi}}{t_{tkm,uçuş\ süresi}}$.	0-10 Points
Empty Weight	10. Calculated using the formula: $\frac{W_{min}}{W_{tkm}}$.	0-10 Points
Target Accuracy and Mission Success	Each ball hitting the 1x1 m target: 15 points (max. 30)	0-30 Points
	Each ball hitting a 2x2 m target: 10 points (max. 20)	0-20 points
	Each ball hitting a 4x4 m target: 8 points (max. 16)	0–16 points
	Outside the target but within a 10 m radius of the centre: 0–10 points	0–10 points
Stability	Flight stability	0-10 Points
Autonomy	Autonomous flight and mission execution	0-15 Points
Penalty Point 1	Unsportsmanlike conduct	0-5 Points
Penalty Points 2	Exceeding the flight start time. *1 point deducted for every 2 minutes of delay.	0-15 Points

4.4.1. Design and Originality (5 Points)

The body and wings of the UAV must be designed and manufactured by the teams themselves. Teams found to have used ready-made UAVs will be disqualified from the competition.

4.4.2. Domestic Content (5 Points)

The developed UAV must be manufactured using domestic resources to the maximum extent possible (e.g. using domestic hardware, software, or both). The hardware and software specified under domestic content must be used in the flight area. For example, a team that develops domestic control systems cannot fly using a different control system in the flight area.

4.4.3.Innovation (5 Points)

Developed UAVs are expected to incorporate innovative features that advance the current state of the art by offering original solutions. Innovation is demonstrated through the use of new hardware, software, design, or auxiliary equipment . Teams meeting one of the criteria listed below under innovation will receive full points for this heading. Examples:

- ***Propulsion System:*** Using a different type of engine or adapting an engine used in another field for the UAV.
- ***Power Source:*** Powering the UAV using a different or alternative power source.
- ***Flight Control Board:*** Designing or using an original flight control board.
- ***Original Design:*** Designing an original fuselage, wing, tail, landing gear, or mission mechanism.

Hardware and software scored under innovation must be used in the flight domain.

4.4.4.Economy (5 Points)

The developed UAV is expected to operate at a lower cost while performing its mission; however, the UAV's performance, efficiency, and capabilities should not be compromised while achieving economic efficiency.

4.4.5.Ease of Production (5 Points)

Ease of production is an important indicator of the efficiency and sustainability of the production process of the developed UAV.

- Design and Usage Simplicity: The design and production of the UAV should be as simple and feasible as possible.
- Assembly Efficiency: The assembly process should be fast and efficient.

4.4.6.Flight Duration (10 Points)

Flight time shall be started when the UAV moves from the start/finish line and shall be stopped when it crosses the same line again after completing its task. The effect of flight time shall be calculated as shown in Equation 1. Only teams that successfully complete the task will be included in the minimum flight time scale. For example, if the fastest team to successfully complete the task (t_{min}) flew in 90 seconds, the team that successfully completed the task in 180 seconds (t_{tkm}) will receive 5 points for this heading.

$$\frac{t_{min,uçuş\ süresi}}{t_{tkm,uçuş\ süresi}} \qquad 10. \text{ Unladen UAV Weight (10 points)}$$

4.4.7. Unladen UAV Weight (10 Points)

The unladen weight of the UAV is the weight of the UAV ready for flight, including all equipment, without tennis balls added. The effect of the unladen weight will be calculated as shown in Equation 2. Only teams that successfully complete their mission will be included in the minimum empty weight scale. For example, if the team that successfully completes its mission and has the lowest empty weight has an empty weight of 800 grams (W_{min}), the team with an empty weight of 1600 grams (W_{tkm}) will receive 5 points for this heading if it successfully completes its mission. Teams will be weighed during the technical inspection and again **after the flight**, and will proceed to the flight after their empty weights have been calculated.

$$\frac{W_{min}}{W_{tkm}} \qquad 10. \text{ Target Accuracy and Mission Success (30 Points)}$$

4.4.8. Target Accuracy and Mission Success (30 Points)

Regardless of how high the technical specifications of the UAV are, the primary expectation is that it successfully completes its planned flight and mission with high target accuracy. Table 3 provides target accuracy scoring criteria for different scenarios.

Table 3: *Target accuracy scoring criteria according to scenarios*

Scenario	Score
Hitting a 1x1 metre target	15 Points (per shot)
Hitting a 2x2 metre target	10 points (per ball)
Hitting a 4x4 metre target	8 points (for each ball)
Outside the target but hitting the area within 10 metres of the target centre	= (10 points - distance of the ball from the target*) *For example, each ball 8 metres away from the target earns the team 2 points out of 10.
Ball landing outside the target and more than 10 metres from the target centre	0 Points

4.4.9.Stability (10 Points):

The UAV is expected to demonstrate stable and safe flight during take-off, cruise flight, mission execution, and landing. This heading will be scored based on criteria such as uncontrolled take-off and climb for take-off stability; unstable deviation in the heading direction, excessive yaw, excessive pitching tendency, and excessive oscillation for cruise stability; and uncontrolled descent and hard landing for landing stability.

4.4.10. Autonomy (15 Points):

Autonomous flight capability receives a higher score than manual flight performed via remote control and plays a critical role in the success of the mission.

- ***Autonomous Programming and Flight Plan:*** Teams flying autonomously **must have a student** responsible for autonomous flight, i.e., responsible for creating the autonomous programming and flight plan. Advisors cannot be responsible for autonomy, and the pilot or assistant student may be responsible for autonomy. The student responsible for autonomy must present the autonomous configuration and flight plan to the technical committee before each flight. Teams may only obtain the coordinates of the poles and targets from the file. The autonomous configuration and flight plan must be prepared in detail using ground station software (Mission Planner, Qgroundcontrol) and must include route planning, altitude profile, speed values, positioning of waypoints, sequence of mission commands (take-off, payload release, landing, etc.), turn procedures, and landing manoeuvres. The use of ready-made configuration templates, automatically generated waypoint sequences, or mission files prepared by third parties is strictly prohibited. Teams are technically responsible for every stage of the autonomous configuration and, if deemed necessary, must present the configuration planning screen, parameters, and log records to the technical committee.
- ***Autonomous flight:*** Autonomous flight consists of the UAV taking off by applying the specified take-off procedure, following the defined route throughout the mission, and safely landing by performing the planned landing manoeuvre. Teams flying autonomously must use telemetry to monitor the autonomous flight from the ground station.

Teams that have successfully completed the autonomous setup but cannot fly autonomously will receive zero points for this category. Teams performing manual flight will also receive zero points for this category.

- Autonomous take-off is worth 3 points, autonomous navigation and autonomous execution of the task is worth 9 points, and autonomous landing is worth 3 points.
- Pilots of teams performing manual flight may not move to follow the aircraft or move towards targets. Pilots must remain **within an area with a diameter of 3 metres around the starting line** and may only **move within this area** to ensure flight safety.

5. GENERAL AND ETHICAL RULES

5.1. Team Formation

- Each team consists of a student pilot, two student assistants, and one advisor teacher, totalling three students and one advisor teacher.
- Teachers cannot serve as pilots. Students cannot serve as pilots or assistants for more than one team.
- Assistant students will perform the following tasks:
  - Place the UAV at the starting point in accordance with the referee's instructions,
  - Remain alongside the pilot during the flight to visually monitor the UAV,
  - Provide verbal support to the pilot as a co-pilot when necessary.

5.2. Competition Participation and Flight Rights Details

- Teams invited to the competition will be evaluated based on the submitted video reports.
- **The top 30 teams** with the highest scores qualify for the competition.
- Each team has **two flight attempts in the preliminary round**; the highest score obtained by the teams from the flights is taken into account.
- After the technical check, **teams** are given **15 minutes** to commence their flight.
- For every 2 minutes of delay**, 1 point is deducted** from the total score**.**
- If the delay exceeds 30 minutes, the team loses its flight right.
- For the flight to be considered valid, the UAV must **land undamaged** (only propeller damage will be permitted).

- Teams that reach the final stage will receive **an additional 2 (two) flight** rights.
- If the task cannot be completed due to unexpected events beyond the teams' control during the competition, such as bird strikes or collisions with foreign objects, the jury may award the teams additional flight rights.

5.3. General Obligations

- **Materials and Equipment:** The provision of all materials and equipment to be used within the scope of the task is the responsibility of the teams.
- **Compliance with Rules:** Teams must comply with all instructions from the competition committee and referees. Teams that violate the rules will be disqualified from the competition. Teams that **display unsportsmanlike behaviour**, in addition to violating the rules, **will be penalised** with a deduction of **5 points** from their total score.
- **Use of the Preparation Area:** When not flying, teams whose turn is approaching are responsible for completing their preparations. It is the team's responsibility to follow the announcements made.
- **Flight Area Coordination:** Provided that the necessary safety precautions are taken, one team may prepare while another is flying.
- **Weather Conditions:** Flights are suspended in rainy weather. Flights are suspended when wind speeds exceed **20 km/h**.

5.4. Technical Checks and Technical Panel Scoring

- All teams undergo **mandatory technical checks** before flying. The technical check examines structural strength, mechanical systems, electronic safety and weight components.
- **Design and Originality, Localisation, Innovation, Economy, and Ease of Production** criteria are scored on the first day. These scores are added to the flight scores for each successful flight and in the final stage.
- After the technical inspection, **it is prohibited to remove or replace any parts** on the UAV.

- **A fail-safe system** that stops the motor in the event of RC link loss **is mandatory**. In the event of RC signal loss, the UAV enters fail-safe mode. In fail-safe mode, the motor is completely stopped (throttle = 0), the ailerons are positioned fully left, the elevator is positioned fully up, and the rudder is positioned fully left.
- **A power cut-off/power supply switch** must be present on the control unit and must be in working order.
- Teams called for technical inspection must be ready for inspection **within 15 minutes**.
- **Disqualification:** Before each flight, the teams' UAVs are subjected to a technical inspection to determine their suitability for flight. As each team has two flight attempts, teams deemed unsuitable for flight on two occasions are disqualified.

5.5. Flight Order

- The flight order is determined by lottery and announced. No objections will be accepted.
- A team not being ready when their turn comes will not be considered a valid excuse for forfeiting their flight right.
- Teams taken to the preparation area must wait with their propellers attached and ready for flight.

5.6. Safety Measures

- The maximum flight altitude **is 120 metres**.
- In case of an emergency or at the judge's instruction, the pilot **must switch** the UAV **to fail-safe mode and land it in a controlled manner**.
- **Fail-Safe Mode Requirement:** A fail-safe system that stops the motor in the event of RC link loss is mandatory. In the event of RC signal loss, the UAV switches to fail-safe mode. In fail-safe mode, the motor is completely stopped (throttle = 0), the ailerons are positioned fully left, the elevator is positioned fully up, and the rudder is positioned fully left.
- LiPo batteries must be stored in **a non-flammable battery bag**.
- The UAV must have **a power on/off switch**.

- Flying with biological or chemical substances that endanger human health is prohibited.

5.7. Appeal Procedure

All appeals made by teams during the competition must be submitted in writing to the competition committee at by the end of the day on which the relevant flight or evaluation took place. Appeals made after the specified time, on subsequent days, or verbally will not be accepted under any circumstances.

5.8. Warnings and Ethical Rules for Competitors

Teams that act in violation of general courtesy rules may be disqualified by the committee.

5.9. Authority of the Competition Organising Committee

The competition organisation committee has the right and authority to amend and revise the rules.