

RULE BOOK

8.Dronetrix

A. Daylight

TASK:

Participants will pilot drones through a challenging obstacle course designed to test their precision, agility, and control in daylight conditions. The goal is to complete the course in the shortest time while adhering to the rules.

DESIGN SPECIFICATIONS:

- Maximum drone weight: **2.5 kg** (including battery).
- Maximum diagonal motor-to-motor size: **600mm**.
- Only battery-powered drones are allowed (maximum voltage: **22.2V (6S)**).
- GPS-based navigation systems are not allowed; manual control is mandatory.
- Drones must have propeller guards for safety.
- The obstacle course will feature hurdles such as hoops, tunnels, vertical gates, slalom poles, and varying altitude zones.
- Specific layout details will be revealed before the event.
- Participants must complete the course within **5 minutes**.
- The competition will be held outdoors in daylight conditions.
- Participants must be prepared for wind and natural lighting.

GENERAL GUIDELINES:

- All drones must pass a safety and technical inspection before the competition.
- Participants must demonstrate the functionality of the drone's fail-safe mechanism during the inspection.
- Each team must have one designated pilot.
- A co-pilot is allowed to assist with visual spotting but cannot operate the controls.
- The drone must navigate through all obstacles in the correct sequence.
- Missing or skipping an obstacle will result in a **time penalty**.
- If a drone collides with an obstacle but continues flying, no penalty will be applied unless the obstacle is skipped.
- Each team is allowed **one restart** in case of a crash or technical failure, provided it is within the time limit.
- Completion time, including penalties, will determine the final score.
- Time penalties will be applied as follows:
 - ✦ Missing an obstacle: **+10 seconds per obstacle**.
 - ✦ Colliding with a safety marker or boundary: **+5 seconds per instance**.
- Drones that fail to complete the course within the time limit will be disqualified from scoring.

Safety Rules

- Participants must avoid designated no-fly zones, marked clearly on the course. Entering a no-fly zone will result in immediate disqualification.
- All drones must be equipped with a fail-safe mechanism to immediately land or return to home (RTH) in case of signal loss or emergency
- Pilots must maintain a safe distance from the flight path.
- Spectators are not allowed within the designated flying zone.
- If a drone experiences a technical failure, it must be safely landed immediately.
- Teams can request their one allowed restart, if applicable.

❖ Judging Criteria for Drone Obstacle Course Event

The following criteria will be used to judge each drone and pilot's performance during the competition. The goal is to ensure fairness, safety, and precision, while accurately evaluating the pilot's skills in navigating the obstacle course.

1. Completion Time (50 Points)

The primary factor in determining the winner is the total time taken to complete the obstacle course, including any penalties. The best performance will be the shortest time to navigate the entire course correctly.

- **Full Course Completion (40 Points):** Successful completion of all obstacles within the 5minute time limit without skipping any obstacles or violating safety regulations.
- **Penalty for Time Violations (up to 10 Points):**
 - +10 seconds for each missed obstacle.
 - +5 seconds for each collision with a boundary or safety marker. ○Time will be calculated based on the total time, including penalties.

2. Precision and Agility (25 Points)

This category evaluates the pilot's ability to navigate the course with smooth control, accuracy, and agility.

- **Obstacle Navigation (15 Points):** The drone should navigate through the obstacles (hoops, tunnels, slalom poles, gates, etc.) with minimal deviation, staying within the designated course boundaries and completing each obstacle correctly.
- **Flight Control and Smoothness (10 Points):** This includes the pilot's ability to control the drone smoothly, avoiding abrupt movements or excessive adjustments. Drones should exhibit fluid motion while maintaining stability, even in wind or varying altitude zones.

3. Safety Compliance (15 Points)

Safety is a key concern during the event. Judges will ensure that each team adheres to the safety requirements and guidelines.

- **Drone Safety Features (5 Points):** The drone must pass the safety inspection, including a functional fail-safe mechanism (return-to-home or immediate landing upon signal loss) and propeller guards.
- **Pilot and Team Safety (5 Points):** Pilots must operate the drone within safety guidelines, maintaining a safe distance from the flight path and avoiding collisions with spectators or personnel. Teams must also stay outside no-fly zones.
- **Emergency Handling (5 Points):** In case of a technical failure, the drone must be safely landed immediately, and the team must follow the correct procedure for requesting a restart if applicable.

4. Technical Performance (10 Points)

This category assesses the reliability and functionality of the drone during the event.

- **Drone Durability (5 Points):** The drone should be able to complete the course without experiencing technical issues (e.g., motor failures, signal loss, battery depletion) that impact performance. The drone must maintain stability and flight control throughout the event.
- **Fail-Safe and Recovery Mechanism (5 Points):** The fail-safe mechanism must function correctly, either performing an immediate safe landing or returning the drone to its home point in case of signal loss or other emergencies.

5. Innovation and Design (5 Points)

While this is a minor factor in judging, it rewards teams whose drone designs are creative, efficient, or particularly well-suited for the challenge.

- **Design Innovation (5 Points):** Consideration is given to the uniqueness and ingenuity of the drone design, as long as it adheres to the technical specifications provided in the event (weight, size, battery, safety features).

6. Penalties for Violations (Variable)

Penalties for rule violations or unsafe behaviour will be strictly enforced. Any violation of the event rules, such as entering no-fly zones, skipping obstacles, or other infractions, will lead to deductions from the overall score.

- **Time Penalties:** Missing an obstacle or colliding with a safety marker or boundary will incur additional time penalties.
- **Disqualification:** Teams entering no-fly zones or failing to comply with critical safety requirements may be disqualified from the event.

❖ **Scoring Overview:**

Criteria	Max Points
Completion Time	50
Precision and Agility	25
Safety Compliance	15
Technical Performance	10
Innovation and Design	5
Total Maximum Score	105

➤ **Note:**

- The **highest total score** will determine the winner, considering both time and skill.
- **Ties** will be broken based on the completion time, with the fastest completing drone ranking higher.
- Teams must demonstrate the ability to handle potential technical difficulties and ensure the drone’s safety in emergency scenarios.