

STEPCONE-2024
STANDARD OPERATING PROCEDURE

EVENT NAME: DRONE AERO CHALLENGE

DEPARTMENT NAME: EEE

EVENT TYPE: Flagship Event

EVENT DESCRIPTION: - Testing the design and pilot skills of the participants by controlling the drone in remote, passing their drones through various obstacles in rounds 1 and 3, and carrying the payload through various obstacles in round 2.

EVENT GUIDELINES:-

DESIGN REQUIREMENTS

Basic Specifications:

- The type of drone can be “Tricopters, Quadcopters, Hex copters, and Octocopters.”
- Quadcopters can be of any shape, such as a plus-shaped quadcopter, a cross-shaped quadcopter, or an H-shaped quadcopter.
- The battery of the drone must be “rechargeable or replaceable.”
- The drone must be made of PVC, plastic, or carbon fibre.

Control Features:

- The Drone must be controlled by wi-fi/Bluetooth/RC.
- The control range of the drone must be less than 200 metres.
- There are no restrictions for batteries. You can use any rechargeable battery with the respective features.

Additional Features:

- The drone length must be less than or equal to 80 cm.
- The drone width must be less than or equal to 60 cm.
- The drone height must be less than or equal to 15 cm.

Special Features:

- The weight of the drone should be less than or equal to 2 kg.
- Flight altitude must be less than or equal to 100 meters.

Rules and Regulations:

- The pilot should come from an academic background and be pursuing a UG / PG degree.
- International participant should submit the document of Unique Identification Number (UIN) and Unmanned Aircraft Operator Permit (UAOP) from Directorate General of Civil Aviation (DGCA).
- Operating the drones other than on the permitted premises is restricted.
- Drones with PV (solar) charging are allowed.
- During demo/ training/ participation in the event, the participants should respect the privacy of people.
- The pilot should operate the drone within the visual range.
- Drones that exceed the specified measurements will be disqualified.
- Fully autonomous/ auto pilot/ smart drones are not allowed.
- The drones should not use the 2D or 3D image data of a vision system/ camera to identify their environment and objects.
- Point of Views – Pilot FPV, Remote Control View, Drone View, 3rd person operation isn't allowed.
- When operating a drone, the pilot should bear all responsibility for ensuring its security.
- The coordinators have the rights to change the rules of rounds if required.
- At any point of time, the organizers/ coordinators decision is final.

Team Specifications:

- Drone Voyage participation is open to any team. "A team should consist of 3 to 5 members".
- **Team Name:** Each team must have a distinct name. The organizers retain the right to disqualify any team with an improper, derogatory, or contradicting name. When a team's name is changed, organizers must be informed.
- **Team Representative:** Each team must indicate their team representative (leader) during online registration. All significant discussions between Organizers and registered teams will be conducted via the team's designated representative. Upon registering, the team representative must provide valid contact information (phone no, email ID, etc.).

Match Frequency:

- A team is given 15 minutes to get ready for their next game. This time is based on when the drone leaves the area where it was set up after its last match.
- If the team doesn't have the drone ready in the pre-match staging area when they are called, they may have to lose the game. Any routine maintenance, like charging the batteries, should be able to be done well within this time frame, or a backup should be kept.
- In extreme cases, the event organizers may decide to extend the time limit.

Wining Criteria:

- The team with the most points and the shortest time to finish Round 3 will be declared the First Winner.
- The team with the second highest number of points and the second lowest time to complete Round 3 will be declared the second Winner (runner).
- In round 3, if the team earns more points and completes round 3 in a longer time period, the event coordinators will make a judgement based on the total points of all rounds and track completion duration in all rounds.

Certificate Policy

- All participants will be given Certificate of Participation.
- Drone is allowed to participate only once in that event.



- Member participated from a team cannot participate in another team for the same event.
- Drone pilot cannot be changed during the course of the event.
- In case of any discrepancies, the decision of the coordinator, technical deputies and the event head shall be the final and no further arguments shall be entertained.
- We request the participants not to assume anything without contacting us.
- Team Drone Voyage is not responsible for any kind of damage to your Drone.

Safety Rules

- Compliance with all event regulations is required. Competitors are expected to adhere to the rules and procedures on their own and do not need continual monitoring. Particular care must be taken to safeguard the ship's batteries and pneumatics.
- If a participant does not comply with the rules of the event, he/she will be disqualified from the event.
- Misbehavior of any kind will not be tolerated and the team will be subjected to disqualification from STEPCONE.
- The drone should not harm the field. Constantly harming the arena may lead to disqualification.
- Event conveners reserve all the rights to disqualify in case of any misbehaviour.
- We request the participants not to assume anything that is not mentioned in the document without contacting the coordinators or Technical Deputies.
- It is better to contact the event organizers before assuming anything about the event and regarding rounds.

It's our sincere request to all the participants to go through this rule book thoroughly and not a single point mentioned in the rule book will be compromised under any circumstances

Team Size/No of Participants: 3 to 5 members

PLAN OF ACTION: -

- It is a **day shift** event .
 - This event consists of 3 rounds
- ***Description of Rounds:***

Round 1:

“The Flight Begins”

Round 1 will be confined to a single track embedded with hurdles. The participants are required to cross as many hurdles as possible. Each hurdle crossed will earn individual points. In this round, the participant can make 1 lap, and the time will be noted. Teams that achieve the highest score in the shortest amount of time will be qualified.

Round 2:

“Strongest Man Standing”

This round checks the payload capability of the drones, the drone has to lift the weights that are provided by the organizers and cross through various hurdles, and the time will be noted.



Round 3:

“The winners RACE”

The selected teams will be put to the ultimate test. The participants should pilot their drone for a given lap in the shortest time possible. The pilot should stay in a fixed place while one of his teammates can accompany the drone as it navigates through the hurdles.

(10:00AM – 4:00PM) Whole event timings

Judging Criteria:

Instructions and Judging Criteria:

ROUND 1:

- The drone has to fly through the various hurdles of variant shapes.
- The obstacles can be rings, cubes, spirals etc.,
- The drone has to fly through the obstacles.
- The drone can be accompanied with its pilot.
- The team will earn points when drone passes each hurdle.
- If the drone falls at any instant then it must be driven from the last checkpoint.

JUDGING Criteria:

- If the drone crosses the circular hurdle, it gains 10 points.
- If the drone crosses low altitude square hurdle, it gains 15 points.
- If the drone crosses hexagon hurdle, it gains 15 points.
- If the drone crosses high altitude square hurdle, it gains 20 points.
- If the drone crosses rectangular hurdle, it gains 20 points.
- If the drone clears the irregular shape, it will be awarded with 20 points.
- Qualification for the next round will be declared based on the points earned and the round's completion time.

PENALITY:

- If the drone touches any of the hurdles, the it will be given minus 2 points.
- If the drone crosses specified boundary, then the team will be given minus 2 points.
- If human interference occurs 2 points will be deducted.
- If the drone is unable to fly for more than 10 sec, then they will be awarded with minus 2 points.

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ROUND 2:

- The team should complete the lap by navigating through the various hurdles.
- 'Drone has to fly with payload from starting point to the ending point through various hurdles.
- The teams have to design or bring their drones in order to hold the weights. The payload that is to be carried will be kept in a cube shaped box attached with a hook.
- If the drone falls at any instant then it must be driven from the last checkpoint.

JUDGING Criteria:



- If the drone crosses the hurdle with the payload box, then it will be awarded with 10 points for each hurdle.
- There will be a total of three payloads. If the drone completes all the hurdles with all the three payloads, then it will be awarded with 10 additional points.
- The weights will be around (50-600) grams. The weight will be provided with hook like structure so as for the drones to hold.
- Qualification for the next round will be declared based on the points earned and the round's completion time.

PENALITY:

- If the drone touches any of the hurdles, then it will be given minus 2 points.
- If the drone crosses specified boundary, then the team will be given minus 2 points.
- If human interference occurs 2 points will be deducted.
- If the drone is unable to fly for more than 10 sec, then they will be awarded with minus 2 points.
- If the drone gets "deviated from the track for 3 time then that team will be disqualified".

ROUND 3:

- This round comprises of various obstacles in vertical direction & the pilot should control the drone from the fixed point.
- The team should complete the lap by navigating through the hurdles.
- Negative points will be awarded if the drone strikes the hurdles.
- If the drone falls at any instant then it must be driven from the last checkpoint.

Judging Criteria:

- Each ring crossed by the drone will get 5 points.
- Time period to complete the lap will be noted.

PENALITY:

- If the drone touches any of the hurdles, then it will be given minus 2 points.
- If the drone crosses specified boundary, then the team will be given minus 2 points.
- If human interference occurs 2 points will be deducted.

