

Department of Aeronautical Engineering

Multidisciplinary UAV Club

CLUB VYOMA



SPARDA

National Level Aero Modeling Competition

VYOMA 25
April - 25 & 27- 2025

RULE BOOK

Table of Content

1. INTRODUCTION

2. GENERAL GUIDELINES

3. DESIGN CONSTRAINTS

4. TEAM STRUCTURE

5. COMPETITION LAYOUT

i. Qualifier round:

ii. Final Round

6. FINAL SCORE

7. SAFETY RULES

8. CERTIFICATE POLICY

9. PRIZE MONEY

10. REVISIONS AND COMMUNICATION



1. INTRODUCTION

The competition provides an exciting and immersive platform for teams to engage in the intricate process of designing, fabricating, and presenting a fixed-wing aircraft system. It serves as a dynamic and stimulating challenge, encouraging participants to showcase their engineering creativity, problem-solving abilities, and operational expertise, all while adhering to specific constraints. Throughout the competition, teams will progress through multiple rounds, each meticulously designed to evaluate their capability to transform theoretical concepts into high-performance, practical aerial solutions. This rigorous process not only tests technical skills but also fosters innovation and the application of engineering principles in real-world scenarios.

2. GENERAL GUIDELINES

- Participants must bring their own RC aircraft and necessary equipment.
- Each team must design and operate radio-controlled (RC) aircraft following the design constraints.
- The goal is to maximize payload capacity relative to aircraft weight and successfully deliver it to a designated area.
- Golf balls (46g, 45mm diameter) will be provided as payloads by the organizers.
- The competition consists of two rounds:
- Qualifier Round – Selects the top 15 teams.
- Main Round – Determines the top three teams.
- The same aircraft must be used in both rounds. Repairs are allowed but no aircraft replacement.
- Teams should carry extra components (motors, batteries, propellers, etc.) to avoid last-minute issues.
- Each team must have 1 to 5 members.
- 2.4 GHz radios are required for all aircraft.
- Receivers must be in "receiver mode only".
- Metal propellers are not allowed.
- Organizers will inspect all systems (servos, motors, etc.). If any system is non-functional, the team will be disqualified.
- Sharing aircraft components (motors, ESCs, batteries, etc.) between teams is prohibited.
- A team member cannot be a part of more than one team.
- In view of stringent safety requirements, if a pilot flies out of the designated flying zone, He/she must immediately turn back and land safely and the team will be disqualified.

3. DESIGN CONSTRAINTS

- The aircraft must be a Fixed-Wing RC aircraft.
- Ready-to-fly (RTF), Almost-Ready-to-Fly (ARF), and Bind-N-Fly (BNF) models are prohibited.
- There is no restriction on maximum aircraft weight.
- Maximum propeller diameter: 13 inches.
- Maximum wingspan: 1.2m.
- Only electric motors are allowed (Internal Combustion engines and other propulsion methods are prohibited).
- Use Gyroscopes (gyros) and programming assistance in receivers are not allowed.
- Autonomous or programmed flights are prohibited.
- FPV (First-Person View) and external flight assistance are not allowed.
- Aircraft can have either be Powered take off with landing gear or manually launched by a team member at ground level.

4. TEAM STRUCTURE

- A minimum of 1 and a maximum of 5 members can be part of a team.
- The competition is an open to all competition.
- An individual cannot be a part of more than one team.
- Participants must present a valid government-issued photo ID on the day of the event.
- If a team requires a safety pilot will be provided on request.

5. COMPETITION LAYOUT

The competition consists of the following rounds

- Qualifier round
- Final round

5.1.1 Qualifier round:

This round evaluates the aircraft's stability and the pilot's control, focusing on maneuverability and precision in navigating a designated track. Teams must demonstrate stable flight, effective maneuvering, and successful course completion within set time limits and boundaries. Performance is assessed based on accuracy, stability, and adherence to the prescribed flight path. The top 15 teams with the best results will qualify for the final round, while rule violations or failure to meet criteria may result in penalties or disqualification

- The aircraft in this round will be empty or will not carry any payload.
- The aircraft is required to maintain a thrust to weight ratio of ≤ 1.2
- If excess thrust is observed, it will be neutralized by adding additional weight to the aircraft

at CG.

- The aircraft must take-off once directed by the Judges.
- The aircraft must fly through a predetermined course and make a safe landing within a designated landing zone.
- The Pilot can position themselves anywhere and move around the arena for this specific round.
- The course consists of two 12ft poles, one 12ft Limbo and a 6ft Limbo.
- The aircraft must fly around the 12ft poles maintaining the altitude below pole height.
- The aircraft must fly clearly under the respective limbos.
- 15 points will be awarded for an aircraft able to successfully fly around each pole.
- 20 points will be awarded for an aircraft able to successfully fly under the 12ft Limbo.
- 40 points will be awarded for an aircraft able to successfully fly under the 6ft Limbo.
- 10 points will be awarded for making a successful landing within the marked zone.
- In an event where the aircraft fails to land within the designated zone 0 points will be awarded for landing.
- A maximum of 100 points will be allotted for this round.
- A team has a maximum of 5 minutes from take-off to landing to complete the round.
- The timer starts once the aircraft takes-off as directed by the Judge.
- The teams will be given two distinct attempts in the qualifier round and the best score of the two will be considered for validation.

5.1.2 Final Round

Aircraft must carry and drop payloads (golf balls) into a **15m** diameter circular drop zone.

- The participants must load their aircraft with the desired quantity of golf balls.
- The golf balls must be independently loaded, it is prohibited to pack the golf balls as a confined load.
- The aircraft is required to maintain a thrust to weight ratio of ≤ 1.2
- The aircraft must take-off once directed by the judges.
- The aircraft must fly or stay airborne for a minimum of 40 seconds after take-off.
- The Payload can be then dropped in the drop zone.
- The first point of impact of the payload will be considered.
- Only golf balls that impact within the designated drop zone will be considered for evaluation. Any golf balls that fall outside this zone will be deemed invalid and will not be considered.
- **Score = (Weight of Payload Dropped in Zone × 100 / Weight of Aircraft without Payload)**
- Landing in the payload drop zone is strictly prohibited. Any team violating this rule may face disqualification.
- The aircraft can land after dropping the payload.

- The maximum time allotted for this round is 3 minutes.
- Two distinct attempts will be given and the best score of the two will be considered.
- The pilot is not allowed to move around the arena for this round and must position themselves as directed by the organizers.

6. FINAL SCORE

- Final Score = $(0.25 \times \text{Score in Qualifier Round}) + (0.75 \times \text{Score in Final Round})$
- The top three teams with the highest Final Score will be the winners.
- In case of a tie, a tiebreaker round will be conducted as per judges' decision.
- Judges' decisions are final.

7. SAFETY RULES

- Flying outside the designated zone results in disqualification.
- If a pilot flies over the event organizing area, they must immediately turn back and land safely.
- The take-off and drop zones may be adjusted based on ground and wind conditions.
- Timer Regulations:
- Teams must be ready to launch within time.
- Failure to launch on time results in forfeiting the attempt.

8. CERTIFICATE POLICY

- The top three teams in the grand finale will be awarded a Certificate of Excellence.
- Certificate of participation will be given to all the participating teams.

9. PRIZE MONEY

The prize money will be awarded to the top 3 Winners via NEFT and will be processed within 45 working days after receiving the prize money from the Sponsors. The Winners must mail the following information (immediately after the announcement of the results) to **vyomaaeroclub@gmail.com**

Subject: Competition name, your position.

Body of mail

1. Account Holder's Name
2. Account Number
3. Bank name and Branch name
4. IFSC Code
5. Photo of Bank Passbook as proof

10. REVISIONS AND COMMUNICATION

Any alterations to the scope of the competition will be communicated to all participants through registered email. Additionally, updates will be posted on the official websites of Vyoma 25', ensuring transparency and accessibility to all participants.

CONTACT US

1. JEET K KANZARIA - +91 99808 46447

2. EBY FRANCIS - +91 82965 25317

Write to us at - vyomaaeroclub@gmail.com

NOTE

Terms and Conditions apply. All rules and regulations are subjected to change as deemed necessary by the organizers, providing flexibility to adapt to unforeseen circumstances and enhance the overall competition experience. Participants are encouraged to stay abreast of any updates communicated through official channels.

The organizers reserve the right to make any changes or updates to the rules and regulations as necessary. Additionally, all decisions made by the organizing committee and judges shall be final and binding

