



TECHFEST 2022-23

BOEING NATIONAL AEROMODELLING COMPETITION

This competition is launched with the vision to provide a unified national platform for students interested in aerospace and related engineering disciplines - to demonstrate their aero-modeling expertise.

Problem Statement:

A team must design, fabricate and demonstrate a fixed-wing aircraft system that can perform the tasks mentioned in the following rounds with given constraints.

Rules on Team structure:

1. Maximum of 4 members in a team. An additional mentor is allowed to accompany the team but will not be allowed to help the team during their participation directly.
2. Members of a team may be from same college/school or different (School/UG/PG).
3. Any number of teams can participate from one college/school.
4. Only students can participate in this competition.
5. Participants are required to get a bona fide certificate signed by the respective HoD/Dean/Principal in addition to their school/college ID Card.
6. A safety pilot might be available at the ground (provided by the organizers) and, if needed, have control on your aircraft in case of emergency. The participant can voluntarily take the help of the safety pilot or fly on their own. However, if the safety pilot feels that the skills of the participant are not adequate, the safety pilot will take over, considering the safety aspects. The final decision on this will be that of the safety pilot and judges and the participant has to adhere to the same.

Design Constraints:

1. The competition requires participants to design and fabricate an RC aircraft. Readymade models, like RTF, ARF, BNF etc., are not allowed.
2. **T/W ≤ 1 without payload** (If excess thrust is measured, it will be neutralized by adding weight below the aircraft at center of gravity)



3. Propeller diameter should not be greater than 13 inches
4. Wingspan should be a maximum of 1.2 m
5. Only electric motors are allowed. The use of IC engines or any other means of providing thrust is prohibited.
6. Use of gyroscopes (gyros) and programming assistance in receivers is prohibited.
- 7.

Abstract Submission:

1. All the participants need to submit an abstract on their aircraft, which should be no longer than 6 pages (A4 size 1.5 line spacing) with standard formatting. The Abstract must document the basic design of the aircraft (dimensions, wing areas, velocity, etc.) and should also explain how their design is suitable for the given problem.
2. Along with the abstract, participants must also send a zip file containing atleast 5 and no more than 10 photographs of the aircraft while it is being built.
3. The Abstract must be submitted as per the format mentioned as per the instructions in the websites of the zonals
4. The shortlist based on the abstract to participate in the zonal rounds would be announced **15** days before the competition date.

Format of the Competition:

The zonal events will be conducted in **4 IITs (East Zone: IIT Kharagpur, West Zone – IIT Bombay, North Zone – IIT Kanpur and South Zone – IIT Madras)**.

IIT Bombay zonal round will be on 16th-18th December during Techfest offline mode.

Top 3 teams from each zonal round will be invited to the national finals at **RVCE, Bengaluru**.

Theme: The theme for the zonal this time is Payload Carrying Capability.

The arena will be open ground. There will be two rounds in the zonal competition.

- A. Qualifier Round
- B. Main Round

A. Qualifier Round

The aim of the qualifier round is to select top 30 teams to the Main Round.

Since the theme is **payload capability**, the qualifier round's objective is to select those teams who built aircraft with good payload-carrying capability and can fly safely while carrying the payloads.

The aircraft should carry one or more than one payload (golf balls of weight - 45g, diameter 43mm - will be supplied by the organizers during the competition) as they can and fly for a minimum time of 30 seconds. The aircraft should then land with the entire payload in it. Payload should not come out of the aircraft until touchdown.

The payload should be mounted inside the aircraft and should not be exposed externally. Judges will examine the aircraft and will allow take-off only when they are satisfied with the payload mounting.

Score: Weight of Payload Carried*100/ Weight of Aircraft without Payload

Those aircraft which will not be able to fly for 30 seconds with the payload will get a 0 score. A maximum time of 3 minutes will be given between the take-off and the landing and the aircraft should complete the round within the time limit.

Top 30 teams, based on the score, will qualify to Main Round from the Qualifier Round. Along with qualification to next round, qualifying teams will get a reimbursement of **INR 5000** per team towards material costs for their models.

The competition criteria for the Finals will be declared soon.

B. Main Round

The aircraft should carry one or more than one payload (golf balls of weight - 45g, diameter -43mm - will be supplied by the organizers during the competition) and drop them in a circular drop zone of 20m diameter.

- The drop should be performed after a minimum flight time of 45 seconds after take-off.



- All the payloads in/on the aircraft should be released in a single drop. The payloads should fall as independent objects and should not be joined together as one bigger payload (sticking them together or dropping a box with multiple payloads in it etc. are not allowed).
- Entire payload should be released using only one channel in the transmitter.

The drop zone is at 40m from the take-off and landing zone. (For a better understanding of the arena, refer to the illustrations below).

Score: Weight of Payload Dropped in the zone*100 / Weight of Aircraft without Payload

A maximum time of 3 minutes will be given between the takeoff and the landing and the aircraft should complete the drop and land within the time limit.

Final Score: Score in Qualifier Round*0.25 + Score in Main Round*0.75

Teams with highest final score will be declared as winners.

If there is a tie, winner will be decided by a separate round framed by the Judges on the spot.

Judges' decisions would be considered final in all cases.

Top 3 teams will be invited to **RVCE Bengaluru** for the finals. The problem statement for the final round will be launched in Feb 2023.

Rules:

1. Each team would be given two attempts in the Qualifier round and two attempts in Payload Round. Best score from both attempts will be considered as a score for each round.
2. The timer will start after 30 seconds of the previous team completing their attempt. The participants need to be prepared in time and launch without delay after entering the take-off zone.
3. The teams would lose their turn if they are not ready in time
4. Same aircraft should be used in both the rounds and it should be the same one in the abstract. In case of damages during the competition, teams can repair the same aircraft but are not allowed to use a replacement. The repaired aircraft should be ready in time for the turn.

Revisions: Any revisions to the Scope of the Competition would be intimated to all the participants via registered email and the same would be updated on the websites of Techfest IIT Bombay,

General Guidelines:

1. The use of 2.4 GHz radio is required for all aircraft competing in the competition. If the participants



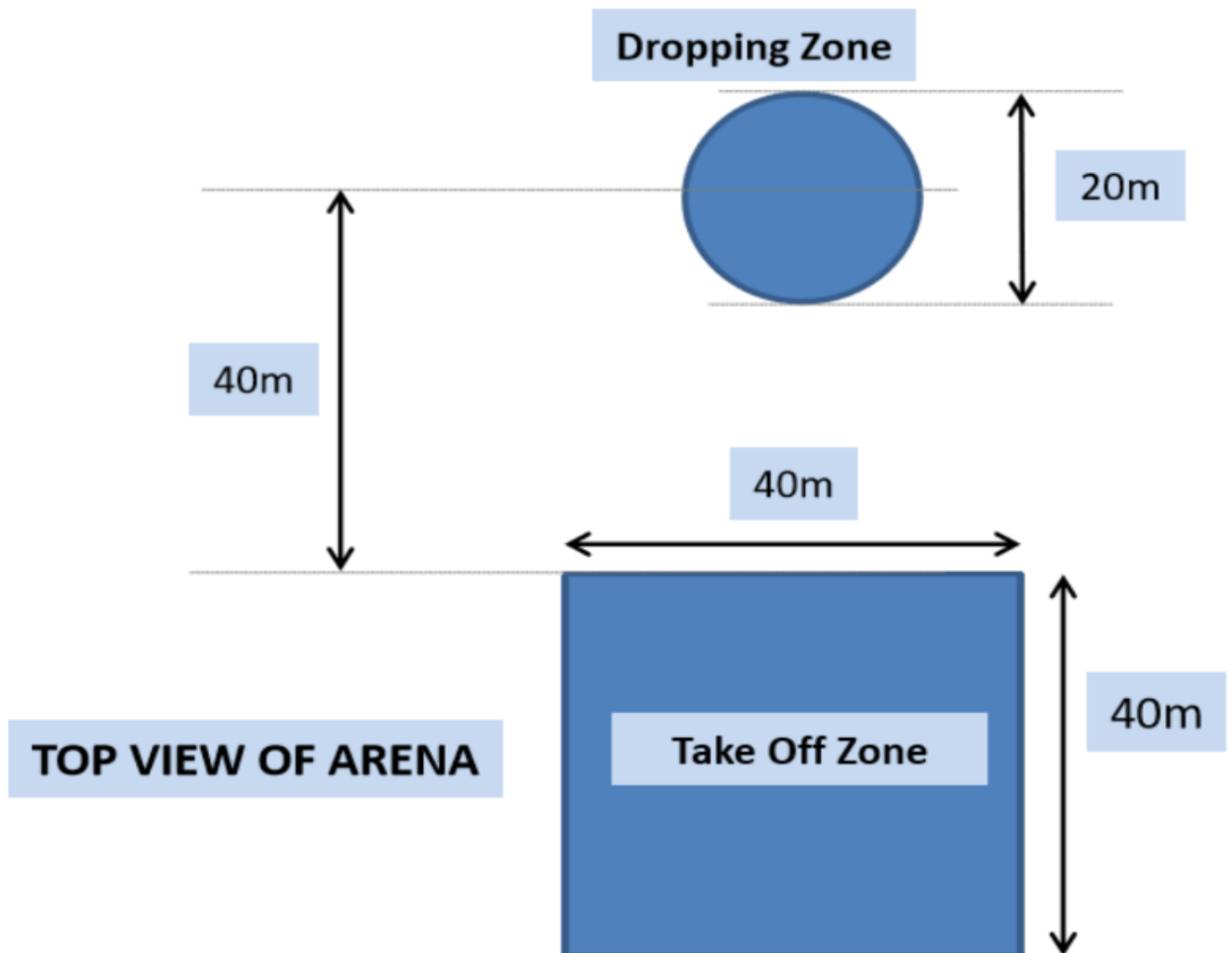
- want to use any other frequency, they will have to inform the organizers in advance.
2. Receivers installed in the aircraft must be in 'receiver mode only'.
 3. All the systems (Servos, motor, etc.) will be checked by organizers for functionality before the competition. If found not working, teams will be dismissed from the competition.
 4. Pilot can position himself at any point in the arena to fly the aircraft during the rounds
 5. In view of stringent safety requirements, if a pilot flies out of the designated flying zone which includes overhead of the event organizing and control section, as mentioned at the venue, he/ she is disqualified and must immediately turn back and land safely.
 6. Teams are suggested to carry additional components (motors, batteries, propellers etc.) as needed to avoid last minute surprises at the venue. You will lose time/ attempt if you are not ready at the time of your turn.
 7. Please do not share any part of your aircraft (motors, ESC, Battery etc.) with other teams. Each team is expected to carry all the equipment needed to participate in the competition.
 8. Metal propellers are not allowed
 9. The models can have powered take-off with a landing gear or can be launched manually by a person standing at ground level
 10. A team member cannot be a part of more than one team
 11. To be eligible for the reimbursement, the qualifying team must share the details of the bank account which belongs to one of the team members. The name on the bank account must match with registered participant's name.

Participation in multiple zonal events/finals:

1. Teams can participate in more than one zonal event if they are not qualified for the finals already
2. Teams that claimed reimbursement in one zonal event cannot claim the same in any other zonal event
3. Same team that participated in the zonal should participate in the final. No member can be replaced by another.

Abstract Submission Deadline	November 30
Abstract result announcement	December 1
IIT Bombay zonal round	16th-18th December
Final at RVCE Bengaluru	February 2023

Area for main round:





CERTIFICATE POLICY:

- Top three teams in the grand finale will be awarded Certificate of Excellence.
- E-Certificate of participation will be given to the teams scoring more than the critical marks which will be decided later.

Prizes:

The Prize money will be awarded to Winners via NEFT and will be processed within 30 working days after the receiving the Prize Money from Sponsors.

The Winner have to mail the following information (immediately after the announcement of results) to abhishek@techfest.org.

Subject: Competition Name, team id- your position (example- Boeing Aeromodeling, BA 1990003-3rd Position)

Body of mail-

1. Account Holder's Name
2. Account Number
3. Bank name and Branch name.
4. IFSC Code