FREQUENTLY ASKED QUESTIONS (FAQs)

AEROTHON - 2025

REVISION HISTORY

Revision	Date	Description
1	April 2025	First Issue

Note: Think of this document as your go-to place for quick answers about AeroTHON 2025! Rule Book lays down the law. This document does not replace or override the Rule Book in any way. Happy Flying!

CHAPTER 1: GENERAL

Q1: Is it possible to postpone the Phase 1/ Phase 2 by 3-4 days due to clash with examination or another event?

A1: Since this is a PAN-India event, the dates are announced after due deliberation. The date once declared will not be changed.

Q2: I am not able to register or stuck in the SAE registration process.

A2: Please reach out to Priya (priya@saeindia.org) who will gladly help you through the process.

Q3: Do we get study resources related to this event?

A3: Yes! SAE will be conducting Professional Development Programs (PDP) which will cover various topics that has been curated to help the students in general and this event in particular. The PDP program roster will be launched soon and will be communicated to the teams.

Apart from this, the event sponsors and partners will also share valuable information. For instance, the event co-sponsor MATHWORKS has set up a microsite dedicated to AeroTHON 2025 (https://in.mathworks.com/academia/student-competitions/sae-india-aerothon.html). It contains complimentary software, self-paced courses and many videos.

Q4: Our college is not supporting us with any travelling allowance or any other kind of funds. Can we attend phase 1 online?

A4: The teams are required to manage the budget for the event (procuring components, machining/ 3D printing for the UAS, travel and incidentals) by themselves. Travel for at least 1 student for phase 1 and the minimum compliment for the phase 2 must be planned. For unavoidable conditions, please reach out to SAE office with an official request letter either from the faculty advisor or Head of the Department. The requests will be address on a case-to-case basis by SAE.

Q5: What if the team members are not available for Phase 1 due to examinations?

A5: It is advised to have a mix of students from different years to have flexibility. For unavoidable conditions, please reach out to SAE office with an official request letter either from the faculty advisor or Head of the Department. The requests will be address on a case-to-case basis by SAE.

CHAPTER 2: UAS DESIGN & MISSION REQUIREMENTS

Q1: What is the UAS type required for the contest?

A1: The required UAS type for the contest is Multirotor.

Q2: What is the category of the UAS in terms of weight?

A2: The UAS category is Micro UAS, meaning the maximum take-off weight including the payload must be less than or equal to 2 kg.

Q3: What is the maximum payload capacity of the UAS? What is the material of the payload?

A3: The maximum payload capacity of the UAS is 200 grams. Material of payload is plastic/ composite rectangular box, a non-conductive material.

Q4: What type of propulsion system should the UAS have?

A4: The UAS should have an Electric propulsion system.

Q5: What is the minimum range requirement for the communication system?

A5: The communication system range should be at least 1 km.

Q6: Can we use fixed-wing or VTOL fixed-wing UAS for the contest?

A6: No, AeroTHON 2025 contest is only for multirotor UAS. Fixed wings and VTOL fixed wings are not allowed.

Q7: What are the dimensions of the payload?

A7: The dimensions of the payload are 12 cm x 7 cm x 7 cm. Refer rule book for additional information.

Q8: What is expected regarding innovation in the payload dropping method and mechanism?

A8: Students are expected to bring innovation in the payload dropping method and mechanism to ensure a safe and effective delivery of the payload to the target point to meet the requirements for the individual missions.

Q9: What aspects should students consider in the design of various systems and sub-systems?

A9: Students should provide design and analysis details of various systems and sub-systems, including selection of Commercially Off the Shelf (COTS) items like batteries, motors, etc.

Q10: Is physical prototyping necessary for Phase 1?

A10: Phase 1 aims to evaluate the design aspects of the UAS and ensure the design meets the mission requirements. Physical Prototype is not mandatory in Phase 1.

Q11: Can we use pre-trained models that are specifically fine-tuned for disaster classification tasks?

A11: Yes, UAS needs to be pre-trained for identifying any disaster situation acting upon identification.

Q12: In round 2 of the flight test, are we provided with the coordinates of two zones for Object Identification and Classification?

A12: No, coordinates of the object detection and classification at two zones will not be specifically given. However, geo-fence coordinates will be provided, and the object detection zones will be withing the Geo-fence.

Q13: How will disasters be shown? Will it be like real-life miniatures or just images (like fire) to showcase them?

A13: Disaster situation will be the real-time miniature. No images.

Q14: Is any material banned for the built?

A14: No specific materials are banned if it is safe. However, the UAS design considers the environmental aspects to reduce the carbon footprint.

Q15: If a Bill of Materials (BoM) is submitted at the initial stage of the AeroTHON 2025, but there is a possibility of price variation due to market fluctuations or availability, what is the appropriate protocol to follow in such cases? Are we allowed to submit a revised BoM at a later stage if significant changes in pricing occur?

A15: Yes, BoM can be altered provided an engineering justification and the difference in cost estimation is not significant. Please note that major changes to the design is not allowed as the team selection is based on the initial design. Additionally, appropriate change request needs to be submitted mentioning what is changed to what and the reason/ justification for the same. The final decision on the change will be made by the AeroTHON technical committee.

Q16: What is the weight of the payload??

A16: Payload weight is 200 gm.

Q17: In analysis part in Phase 1, are both CFD and FEM are compulsory or, anyone will be, okay?

A17: CFD analysis is needed to design in terms of an aerodynamics standpoint and FEM is needed to design the structural aspects of the UAS.

Q18: In mission 1, the drone delivers the payload by ground zero placement or dropping it from certain height.

A18: Placing the payload safely at ground zero. No payload will be dropped in Mission 1

Q19: Are we allowed to add any additional casing to the payload?

A19: No additional casing is allowed. The safety of the fragile payload must be achieved by the stability and capability of smoothly landing of the UAS and not through additional support to the payload.

Q20: Will any Kits be supplied to participants?

A20: No, participating teams sponsor themselves to design and build the UAS.

Q21: As mentioned in Mission 2 detail, the object may be partially obscured, what do you mean by the object partially obscured?

A21: In Mission 2, objects will be places on the ground to be identified and detected. There is a possibility for partially hidden of the objects. For example, two boxes will be placed one above the other in a way that one box is not completely visible from top view. Another scenario is where a screen is placed, and the object may be visible only from one side of the screen.

Q22: What are the key aspects to be focused on technical documentation?

A22: Focus on areas detailed in the Rule Book evaluation criteria. Please keep the chapters in line with the evaluation criteria.

Q23: Is the terrain for phase 2, going to be flat or hilly with slopes? Also, what is the expected surface like grass, sand etc.?

A23: Terrain for Phase 2 to be either flat or a minor change in the elevation based on the venue. You can expect the surface be Sand, Grass, or Mud.

Q24: As soon as the disaster situation is detected, do the UAS supposed to drop the payload anywhere inside the disaster zone or will there be a specific target?

A24: Payload must be dropped inside the disaster zone and the scores will be given based on the proximity to the ideal drop point.

Q25: Can we have any mechanism attached to the payload while dropping the payload something which is attached to the payload even after dropping?

A25: No extra attachment to the payload is allowed.

Q26: Can we use FPV goggles for Phase 1 challenge?

A26: FPV goggles are not required as there will not be any flight test in Phase 1. Phase 1 is purely for design reports and presentation.

CHAPTER 3: PHASE 1 – DESIGN REPORT SUBMISSION

Q1: What is the purpose of the design report and presentation?

A1: The design report serves as the primary means for teams to convey their design decisions and engineering philosophy for their UAS, demonstrating how it is suited to perform the intended mission and highlight your innovation. It is also used to highlight any optimization performed and used as a baseline specification and BoM for the drone that will be built for Phase 2. The presentation can be used to summarize the design to industry experts and get their feedback. Beyond that the design report and presentation are used to select the teams moving forward to the phase 2 of the competition.

Q2: What should be included in the design report and presentation?

A2: The design report and presentation should include the following contents:

a) Conceptual Design

b) Detailed Design

c) Final UAS Specifications and Bill of Materials

d) System design for capturing survey data

e) Methodology for Autonomous Operations

f) Summary of innovations in the overall design.

For other details refer to the evaluation criteria in the rulebook.

Q3: What is included in the Conceptual Design section?

A3: The Conceptual Design section includes a high-level physical view of the UAS, detailing its physical elements and their arrangements.

Q4: What does the Detailed Design section cover?

A4: The Detailed Design section covers various aspects such as estimation of preliminary weight and thrust required, selection of propulsion system, UAV sizing, UAS performance, material selection, subsystem selection, C.G. estimation, stability analysis, preliminary CAD model, computational analysis, and optimized final design.

Q5: What information should be provided in the Final UAS Specifications and Bill of Materials?

A5: The Final UAS Specifications and Bill of Materials should include detailed specifications of the UAS, and a breakdown of the materials and components used in its construction.

Q6: What does the System design for capturing survey data entail?

A6: The System design for capturing survey data outlines how data will be collected, recorded, transmitted, and retrieved during UAS operations.

Q7: How should teams address the methodology for Autonomous Operations?

A7: Teams should describe how autonomous flight will be implemented, autonomous object/target identification methods, and the mechanism for autonomously dropping/delivering payload to precise positions.

Q8: What is expected in the Summary of innovations in the overall design?

A8: The Summary of innovations should highlight any unique or innovative aspects of the UAS design that differentiate it from existing solutions.

Q9: Where can I find more information about the evaluation criteria, design report, and presentation guidelines?

A9: Refer to AeroTHON 2025 Rule Book for detailed information on evaluation criteria, design report requirements, and presentation guidelines.

CHAPTER 4: PHASE II – FLYING ROUND

Q1: What are the stages of the SAEINDIA AEROTHON Phase 2?

A1: The Phase 2 consists of two stages: Technical Inspection, and Flying Competition.

Additionally, there is Tiger's Cave stage, focussed on developing an entrepreneur mindset, which does not contribute to the overall contest score but has a special category award.

Q2: How are the winners determined in AeroTHON 2025 contest?

A2: The winners are decided based on total marks earned by the teams across the Technical Inspection and Flying Competition stages.

Q3: What happens during the Technical Inspection stage?

A3: The Technical Inspection ensures that all UASs comply with specified design requirements and safety standards. It includes checks for dimensions, component use, structural integrity, failsafe mechanisms, and more check points listed in the evaluation criteria in the rulebook.

Q4: How does the Flying Competition work?

A4: The Flying Competition involves four mission attempts: two manual and two autonomous. Each mission focuses on tasks such as surveying, object detection, obstacle navigation, and payload drop. Scoring is based on mission success and performance.

Q5: What is Tiger's Cave, and how does it work?

A5: Tiger's Cave is a stage designed to foster an entrepreneur mindset among participants. Teams pitch their product ideas to industry experts and gain insights. While not contributing to the contest score, the best team in this stage receives a special category prize.

Q6: What are some key ground rules for the Flying Competition?

A6: Ground rules include maintaining etiquette, following safety guidelines, cooperating with officials, adhering to flight schedules, and promptly sharing mission data with the jury.

Q7: How are mission scores calculated in the Flying Competition?

A7: Scores are awarded based on mission success criteria, including survey accuracy, object detection, payload drop precision, and adherence to flight parameters. Refer to Section 5 for detailed scoring information.

Q8: What should teams do if there are deviations from the original UAS design?

A8: Any deviations must be documented and submitted using the Modification Change Request form. Teams should be prepared to explain and justify design changes to the jury. Major changes are not allowed, and the decision will be decided taken by the AeroTHON technical committee.

Q9: How can teams prepare for Technical Inspection and Flying Competition?

A9: Teams should review the contest guidelines thoroughly, conduct self-inspections, ensure UAS compliance, practice flight missions, and be ready to present their designs and performance data confidently.

Q10: While going through the maze, should the UAS rely on the FPV view, or will the drone be in line of sight?

A10: Obstacle Navigation Course will be in the line of sight. Pilot is allowed to use FPV goggles. However, FPV googles is not mandatory for the competition.

Q11: Is 3-D printing allowed for the components?

A11: Yes, it is allowed.

Q12: Is there any limitation on sensors or related electrical components or software applications used?

A12: No limitations on components if total weight is within the specification. You are allowed to use necessary sensors to complete the mission without deviating the Rule Book.

Q13: Are all the members required to be present for Phase-1 presentation or can only 2-3 members be present?

A13: It is not mandatory for the entire team to be available for Phase-1 presentation.

Q14: Will changes done to drone battery capacity be considered as a design change?

A14: Yes, all changes from Phase-I design report need to have an Engineering Change Request Form filled and submitted to the Jury Panel.

Q15: Can we change the battery for each mission, or we need to use only one battery for both the missions?

A15: Teams are allowed to use the different battery provided it meets the original battery considered for the design.

Q16: Will two missions be done in a consecutive manner continuously? or will be provided the time for changing and charging battery?

A16: The two missions are not consecutive. The teams will have ample time in between the missions to change and check their UAS.

Q17: What is the height of obstacles? What would the obstacle look like? Are the obstacles tall walls?

A17: Refer to Rule Book Section 4.2.3 for the sample obstacles. The mission objective is to evaluate pilot skill and manoeuvrability of the UAS to safely place the delivery. It is recommended to optimally design your UASs with suitable aspect ratio considering the mission requirements. The details of the obstacle height and width will be shared with the selected teams after Phase 1.

Q18: What should be included in the time stamp?

Q18: The date and time must be present in the time stamp to ensure that the images are captured during the current mission.

Q19: Is it allowed to use pre-existing algorithms from the internet for identification and counting?

A19: Yes, the teams can use pre-existing algorithms and improvise for the team's requirement. But the teams must mention the algorithm in the report and give credit to the source and cite the reference.

Q20: Are objects to be detected and classified by the drone itself while airborne during the autonomous mission (Mission 2)?

A20: Yes, the objects must by detected and classified by the drone/ ground station autonomously.

Q21: If the drone has detected the disaster situation before identifying objects should the UAS drop the payload or continue to find other object classification area and lastly drop the payload?

A21: It can drop the payload and resume with object identification and classification. It need not be the last step.

Q22: How many attempts will be provided for each flight mission?

A22: Each mission will have only one attempt. Team should participate in the scheduled slot for each mission.

Q23: Are the pilots allowed to move behind the drone during manual mission and payload placement?

A23: Pilot can move along the boundary of the mission 1. However, pilots are not allowed to move along the UAS. The pilot can choose to stay at the launch area and use FPV camera for navigating through the obstacles.

Q24: Will the drone take off with payload or needs to pick up the payload from somewhere?

A24: The drone will take off with preloaded payload in both the missions. Payload will not be picked up by the UAS itself.