NATIONAL AERO-GENIUS COMPETITION (NAGC) - 2026

ROTORCRAFT UAV CHALLENGE

Competition Rules and Requirements

Organized by
Department of Aerospace Engineering
Aviation & Aerospace University, Bangladesh (AAUB)

Competition Date: 30-31 October 2026 | Venue: AAUB Campus, Lalmonirhat, Bangladesh
Registration Link: https://event.aaub.edu.bd

Introduction

The National Aero-Genius Competition is the first-of-its-kind event in Bangladesh, organized by and hosted on the campus of Aviation & Aerospace University, Bangladesh. In this event, teams from various universities will participate in the National Aero-Genius Competition, showcasing their hands-on skills and problem-solving capabilities.

The contest will provide engineering students with a real-world UAV ROTORCRAFT design experience by allowing them to validate their analytic studies. Student teams will design and demonstrate the flight capabilities of an electric-powered, remote-controlled UAV ROTORCRAFT that can best meet the specified mission profile.

NOTE: Items critical to safety and rule compliance are mentioned throughout this document. It is the responsibility of all teams to know and follow all provided rules and all fly off day briefings.

Participating teams will be evaluated on three equally important pillars: their written Technical Design Report, successful passage of a rigorous Technical Inspection, and flight performance during the Competition Fly-off. The team achieving the highest overall score will be declared the winner.

This rule book will provide all the guidelines for this competition.

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1. General Information

1.1 Requirements for Participation

1.1.1 Affiliation

- Participants can be students or affiliated with an academic institution (from high school to university) as well as hobbyists in the field of UAV.
- Industrial organizations and/or military organizations cannot be the participants in this competition.

1.1.2 Team Composition

- Teams shall consist of maximum four (4) participants.
- A team may include no more than one graduate student (considered within the team composition).
- Teams may have faculty and/or non-faculty advisors (not considered within the team composition).
- Teams formed with participants from several different institutions are allowed.
- Teams must designate a Team Leader who will be the primary point of contact and select a unique team name.

1.1.3 Number of Teams

There is no limit to the number of teams participating from a single institution. However, one participant cannot be a part of multiple teams.

1.2 General rules

- The competition will consist of the following rounds:
  - (i) Design Report Submission
  - (ii) Technical Inspection Round &
  - (iii) Fly-Off Round.
- Each team must showcase their device (along with oral technical overview) for ratification prior to the commencement of the competition. Teams are prohibited from making any modifications to the code or model/design of the UAV ROTORCRAFT after showcasing, except for software-related adjustments.
- Judges may request explanations regarding any mechanisms of the UAV ROTORCRAFT and reserve the right to inspect the code/software/device if deemed necessary.
- The decisions made by the judges will be final and binding. No objections or appeals will be entertained regarding their decisions.
- Each team is responsible for bringing its own supporting equipment, such as laptops, batteries, chargers, converters, multi-plugs, and other necessary tools.
- Participating teams are solely responsible for the safety of their devices. Teams will be held accountable for any incidents or damage caused by their UAV ROTORCRAFTs or team members.
- The organizers reserve the right to amend or modify the competition rules as they see fit.

- Trial runs on the competition track are strictly prohibited.
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- The organizers' official time recording stands as the definitive measure for scoring of the teams.

1.3 Team Pilot

The pilot may be a team member or a non-student designee; however, all pilots must be experienced in manual flight. Pilots must sign in with the competition officials through the team leader on the day of the fly-off. The organizing committee may provide volunteer pilots on an as-available basis to teams whose designated pilot is unable to attend; teams requiring this assistance must coordinate through the organizing committee at least 72 hours in advance.

1.4 Sportsmanship and Code of Conduct

All teams and participants are expected to uphold the highest standards of sportsmanship during the competition. Attempts to intentionally violate the rules or negatively impact the performance of other teams will not be tolerated. Penalties for violations will be decided by the Contest Administration and may range from a warning and loss of a mission score to full disqualification from the current and future competitions.

- Displays of disrespect toward judges, volunteers, security personnel, or opposing teams will lead to disqualification.
- Threats, misbehavior, or any actions intended to create disturbances or conspiracies will result in immediate disqualification.
- Teams failing to arrive at the venue within the designated time slot will be disqualified.
- Any damage caused to AAUB's arena infrastructure or equipment by a team's UAV may result in immediate disqualification and financial liability.

2. Schedule and Registration Information

Teams that will be selected for the flyoff after the Design Report submission will be required to pay the Flyoff registration fee.

Item	Date / Requirement
Pre-registration Deadline	*15 August 2026*
Technical Report Submission Deadline	*01 October 2026*
Notification of Technical Report Result	*10 October 2026*
Registration Deadline	*15 October 2026*
Registration Fee	*BDT 1000 per selected team for the fly off*

3. Design Report & Submission Method

All team must prepare Technical Report of their UAV ROTORCRAFT in pdf format. Formatting and submission procedure:

- Each team will submit a 10 pages report before 01 October 2026.
- Reports must have 1.15-line spacing with 11-pt Arial font minimum.
- Report PDF must be formatted as 8.5” x 11" (A4) pages.
- Reports must have the team's name on the title of the report.
- Electronic report files must be named: “2026_NAGC_Rotorcraft_[Team name]_[Institution Name].pdf.
- Technical Report Submission Link: nagc@aub.edu.bd (The email Subject will be ‘National Aero-Genius Competition (NAGC) 2026 Fixed-wing’)

4. Rotorcraft & Mission Requirements

4.1 General Requirements

- The rotorcraft must be manually operated and controlled by the participants. GPS Module are not allowed.
- The maximum allowable dimensions for the rotorcraft, including the propellers, are 500 mm x 350 mm x 350 mm and MTOW is 2.3 kg.
- Ready-made rotorcrafts are not permitted, except for pre-fabricated frames.
- The use of jamming devices is strictly forbidden.
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- The use of FPV (First Person View) cameras is permitted. FPV goggles are not allowed.
- Full metal propellers are forbidden.
- Only electric motors are allowed.

4.2 Competition Guidelines and Scoring System

The competition shall evaluate each team based on technical design, construction quality, operational safety, obstacle-course performance, payload capability, image capture, flight accuracy and completion time. The maximum obtainable score shall be 500 points: 100 points for the Technical Report, 100 points for Technical Inspection and 300 points for the Fly-off.

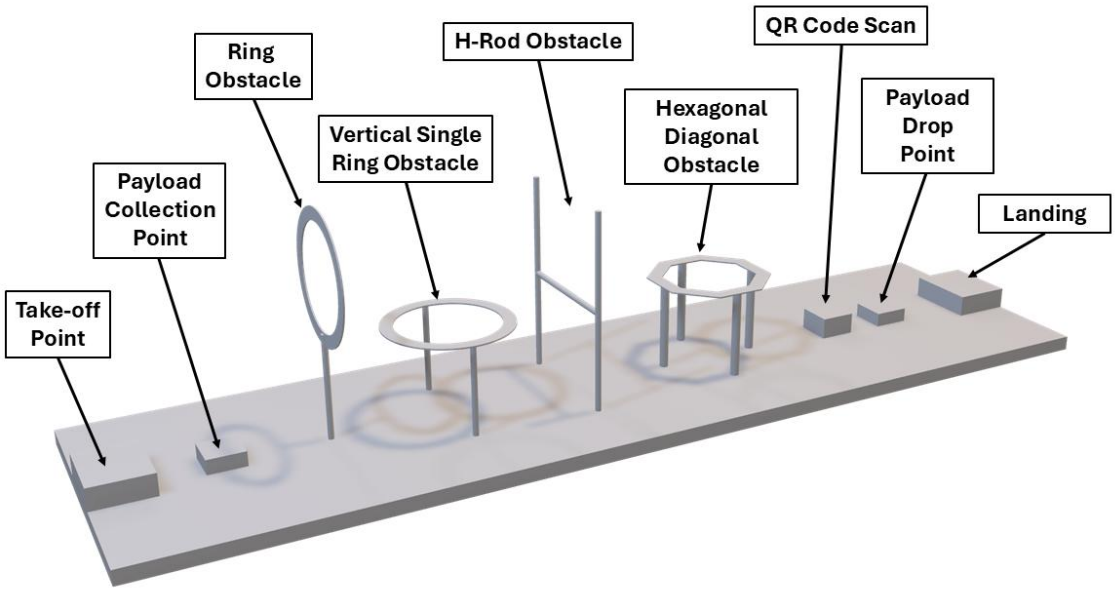

Figure 1: Demo Flight Path

4.2.1 Technical Report (Score: 100)

- The Technical Report will carry 100 points, and Technical Inspection will carry 100 points.
- Technical Inspection will evaluate compliance, construction quality and operational safety. A team must pass all safety-critical requirements before participating in the Fly-off.
- Format Requirements

    - Maximum length: 10 pages.
    - Font Name: Arial
    - Line spacing: 1.15.
    - Minimum font: 11-pt Arial.
    - Page size: 8.5 in × 11 in.
    - The team's name and the institution/institution's name shall appear on the title page.

4.2.2 Technical Inspection (Score: 100)

- Technical Inspection will be carried out by the judges before the flight and will be scored out of 100 points.
- The Technical Inspection score shall cover:
    - Frame and dimensional compliance (20),
    - Motor, propeller, ESC and battery installation (20),
    - Structural integrity and workmanship (20),
    - Payload mechanism (20), and
    - Flight-control, failsafe and overall safety compliance (20).

4.2.3 Obstacle Avoidance (Score: 80)

- There will be four obstacles (from the demo flight path shown above) positioned along the rotorcraft's path.
- The dimension of each of the obstacle will be approximately 1.75 times the maximum allowable dimension of the rotorcraft as outlined in this document earlier.
- Each avoided obstacle will be awarded 20 points to the team.
- If the rotorcraft encounters an obstacle, 10 points will be deducted for each contact.4.2.4 Image Capture/QR Code Scan Task (Score: 20)

4.2.5 Image Capture/QR Code Scan (Score: 20)

- The flight track will contain an object, e.g., AAUB flag, whose image must be captured by the camera of the UAV ROTORCRAFT, or there may be a QR code which needs to be scanned.
- The sizing and quality of the captured image/scanned code will be evaluated by comparing it with the reference image.
- A perfect match will award the team 20 points. Other teams will receive proportional points based on the quality of their captured image.

4.2.5 Payload Performance (Score: 140)

Payload Delivery:

- Each Rotorcraft UAV needs to have an arrangement to pick up a payload from designated payload pickup spot.
- During the picking of payload, the UAV ROTORCRAFT must be kept airborne.
- Payload must be designed and carried out by the individual team; it can be of any shape or size. However, the UAV ROTORCRAFT with the payload will need to cross all the obstacles by going through the rings (not around or over it) and then drop the payload in the designated payload delivery spot, as shown in Figure 1.
- The mechanism for picking up and dropping of payload by the UAV ROTORCRAFT must be designed by the team and must be mentioned in the technical report.

Payload Fraction:

- The payload fraction is defined as the ratio of the rotorcraft's total weight (including payload) to its empty weight.

$$PF = \frac{\textbf{Payload Weight}}{\textbf{Maximum Take-off weight}}$$

Payload Performance Index:

$$\boxed{PPI_i = \left(\frac{PF_i}{PF_{\max}}\right) \times D_i}$$

where:

PF_i = payload fraction of Team i
$PF_{\max}$ = highest payload fraction achieved by any team
D_i = payload delivery factor

$$D_i = \begin{cases} 1.0, & \text{qsaacqqdsj n\_wjm\_b bcjgj cpw} \\ 0, & \text{sl qsaacqqdsj n\_wjm\_b bcjgj cpw} \end{cases}$$

Payload Performance Score:

$$\boxed{S_{Payload,i} = 140 \times PPI_i}$$

Example:

If the best payload fraction is 2.00:

Team	Payload Fraction	Delivery	Calculation	Score
A	2.00	Successful	$140 \times 2.00/2.00$	140
B	1.80	Successful	$140 \times 1.80/2.00$	126
C	1.50	Successful	$140 \times 1.50/2.00$	105
D	2.20	Failed	Delivery factor = 0	0

4.2.6 Flight Time (Score: 60)

- Teams completing all tasks in the shortest flight time will receive 60 points.
- Other teams' scores will be calculated using the formula:

$$\boxed{S_{FT,i} = 60 \times \sqrt{\frac{T_{\min}}{T_i}}}$$

where:

$T_{\min}$ = fastest valid flight time
T_i = time taken by the team
$S_{FT,i}$ = flight-time score

Example:

If the fastest team takes 100 seconds:

Team	Time	Formula	Score
A	100 s	$60\sqrt{100/100}$	60.0
B	110 s	$60\sqrt{100/110}$	57.2
C	130 s	$60\sqrt{100/130}$	52.6
D	160 s	$60\sqrt{100/160}$	47.4

5. Score Summary

Task	Identifier	Score
Technical Report	*T*	100
Technical Inspection	*TI*	100
Obstacle Avoidance	*O*	80
QR Code Scan/Image Capture	*I*	20
Payload Performance	$S_{Payload,i}$	140
Flight time	$S_{FT,i}$	60
Overall Score	$S = T + TI + S_{Payload,i} + S_{FT,i}$	

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6. Overall Mission Profile

- The rotorcraft will fly from a designated place and pick up a payload from another designated spot. Afterwards the rotorcraft will complete the path avoiding the obstacles and then drop the payload at another designated place. Finally, it will hover in a place and capture the image and land at a landing spot (as shown in figure).
- The dimension of the obstacles will be 1.75 times the rotorcrafts maximum specified dimension mentioned in this document.
- The ROTORCRAFT must strictly follow the predefined path and is not permitted to proceed to the next obstacle until the current obstacle is successfully completed, unless the team chooses to skip the obstacle entirely.
- Repeatedly crossing the same obstacle will not contribute any additional points to the team's score.
- The timer will also halt as soon as the ROTORCRAFT successfully touches down in the designated landing zone.
- The organizers' official time recording will serve as the final and authoritative measure for scoring purposes.
- Trial runs on the arena are strictly prohibited.

- A restart will only be permitted if the ROTORCRAFT becomes immobile and requires external assistance. In such cases, the ROTORCRAFT must resume from the designated marked point closest to the last completed checkpoint.
- In the event of a tie in scores, the following criteria will be used to determine the ranking:
  - Teams that complete the course without skipping any checkpoints will be given priority.
  - If a tie persists, better image of the object will be given priority.

Disqualifications

Code of Conduct and Disqualification Criteria

- Any damage caused to the arena by a team's rotorcraft may result in immediate disqualification.
- Displays of disrespect toward judges, volunteers, security personnel, or opposing teams will lead to disqualification.
- Teams may be disqualified for offenses such as misbehavior, threats, or any actions intended to create conspiracies or disturbances.
- Teams failing to arrive at the venue within the designated time will be disqualified.

8. Scoring Guidelines and Penalties

Scoring Guidelines and Penalties

a) Time calculations will not consider millisecond precision.
b) Penalty Deductions
   - If the pilot steps outside their designated zone, 20 points from the flyoff score will be deducted for each occurrence. However, other team members may assist the pilot when necessary.

9. Prize Money

Position	Prize
1st Prize	BDT 80,000
2nd Prize	BDT 60,000

10. Contact Information

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