

# NATIONAL AERO GENIUS COMPETITION - 2026

## *Line Following Robot*

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### **Competition Rules and Requirements**

*Organized by*

**Department of Avionics Engineering  
Aviation & Aerospace University, Bangladesh**

Competition Date: 30-31 Oct 2026 | Venue: AAUB Campus, Lalmonirhat

Registration Link: <https://event.aaub.edu.bd>

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## Introduction

A line following robot is an autonomous robot that follows a predefined path marked by a visible line, typically black on a white surface or vice versa. It uses sensors, usually infrared (IR) sensors, to detect the difference in surface color based on light reflection. These sensors send signals to a controller, such as a microcontroller, which processes the data and determines the robot's movement.

The robot moves using DC motors controlled through a motor driver circuit. When the sensors detect deviation from the line, the controller adjusts the motor speeds to bring the robot back on track. This continuous feedback system allows the robot to follow the path accurately.

Line following robots are commonly used in industrial automation, including automated guided vehicles (AGVs) for transporting materials. They are also popular in educational projects and robotics competitions, helping learners understand basic concepts of sensors, control systems, and embedded programming.

**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.**

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

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## 1. Team Formation and Eligibility

- Each team may consist of a maximum of four members.
- Teams may consist of students from more than one institution.
- An individual may join only one team and cannot register for multiple teams.
- Only the designated team leader or captain is permitted to present the robot and contact the organizers for claims or specific needs during the live competition.

## 2. Robot Specifications

To ensure fair competition, all robots must adhere to the following physical and technical constraints:

- **Dimensions:** Maximum dimensions are 25 cm x 25 cm x 25 cm.
- **Weight:** The robot must not exceed 2 Kg.
- **Power Supply:** Motor operating voltage must be within 12V to 24V.
- **Autonomy:** The robot must move autonomously and must be initiated with the push of a switch. Any use of wireless communication modules for control during the run is strictly prohibited and will result in immediate disqualification.
- **Originality:** Any commercially available or pre-assembled readymade robots are strictly forbidden. However, custom printed circuit boards are allowed.

## 3. Arena Specifications

- The arena is approximately 4m x 4m ( $\pm 0.5$ m).
- The path may include straight lines, curved lines, sharp corners, loops, gaps, obstacles, and bridges.
- Line gaps will not exceed 15 cm.
- The line width is 2.5 cm, featuring a black line on a white surface (or the reverse).
- There will be designated 25 cm x 25 cm Start and End boxes, along with multiple checkpoints throughout the track.

## 4. Contest Rules and Gameplay

- Teams must be present at the venue at least 30 minutes prior and hand over their robot to the organizers 10 minutes before the event starts.
- Each team receives 1.5 minutes for sensor calibration on the track. During this window, only one member can handle the robot, and hardware modifications are prohibited; teams may only change and upload code.
- Following calibration, teams have exactly 5 minutes to complete the course.
- The robot must operate reliably under any venue lighting conditions. Teams must take measures to isolate sensors from external lighting like camera flashes.
- A maximum of 5 restarts are allowed per run. If a robot diverts uncontrollably, gets stuck for more than 15 seconds, or is touched by a team member, it must restart from the last crossed checkpoint. Points will be deducted for each restart, and no additional time will be granted.

## 5. Scoring System

Winners will be determined by the highest total points achieved during the 5-minute run. The Total Score (TS) is calculated using the following parameters and formula:

- **T** = Remaining Time (out of 300 seconds)
- **C** = Base point per Checkpoint (+15 points)
- **N<sub>cp</sub>** = Number of Checkpoints crossed
- **R** = Deduction per Restart (-10 points)
- **N<sub>r</sub>** = Number of Restarts
- **E** = Bonus for stopping accurately at the End Box (+20 points)
- **W** = Bonus for completion without any restarts (+25 points)

**Formula:**  $TS = 0.5T + N_{cp} * C + N_r * R + E + W$

## 6. Disqualification

The organizing committee reserves the right to disqualify any team without refund for the following infractions:

- Using any type of wireless module for control.
- Employing mechanisms that cause damage to the track or arena.
- Any form of behavioral misconduct, poor sportsmanship, or nonconformity to the general rules.

## 7. Format Requirements of Technical Reports

- Maximum length: 500 words.
- Font Name: Arial
- Line spacing: 1.15
- Minimum font: 11-pt Arial
- Page size: 8.5 in x 11 in.
- The team name and the institution/institutions name shall appear on the title page.
- Recommended filename format: 2026\_Aero\_Genius\_LFR\_[Team Name]\_[University Name/Institution/Individual].pdf.
- Should mention all the requirements/specifications of the Line Following Robot following the rule book.

## 8. Schedule and Registration Information

Item	Date / Requirement
Registration Deadline	1 <sup>st</sup> Oct 2026
Pre-Registration Date	1 <sup>st</sup> Aug 2026
Competition Date	30-31 Oct 2026
Registration Fee	2000 tk

## 9. Prize Money

Place	Prize
1st Prize	BDT 50,000
2nd Prize	BDT 35,000
3rd Prize	BDT 30,000

## 10. Contact Information

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