

ROBOFEST 2026

Technical Specification School Category



Organized by:
Faculty of Engineering
Sri Lanka Institute of Information Technology



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ROBOFEST 2026

The 16th annual robotics festival, ROBOFEST 2026, organized by the Faculty of Engineering at the Sri Lanka Institute of Information Technology (SLIIT), is a highly anticipated event that unites students from schools and universities to showcase their innovation, creativity, and technical expertise in robotics. This festival acts as a platform for participants to demonstrate their theoretical knowledge and practical skills in robotics, promoting a spirit of competition, collaboration, and learning.

Event Overview

- **Venue:** *Sri Lanka Institute of Information Technology, Malabe Campus*
<https://maps.app.goo.gl/FuwgnNQyh9d4dqip9>
- **Date:** (To be announced)
- **Categories:**
 1. *University Competition*
 2. *School Competition*

Important Days to Remember

Registration Start Date:	28/04/2026
Registration Close Data:	31/07/2026
Level 1 Video Submission Starting Date	01/08/2026
Level 1 Video Submission Closing Date	15/08/2026
Level 1 Results Releasing Day	31/08/2026
Final Competition Day	28/09/2026

School Category Competition

ROBOFEST 2026 – School Competition is the ultimate challenge for young robotics enthusiasts across Sri Lanka! This exciting event pushes students to showcase their engineering creativity, problem-solving abilities, and technical expertise through the design and implementation of autonomous mobile robots.

Participants will compete in an exciting, multi-stage challenge designed to test their robotics skills across various technical domains. The competition will include:

- **Line Following** – *Ensuring precise movement along a designated path using sensors.*
- **Dead-End Navigation** – *Detecting and correctly handling dead-end scenarios.*
- **Robotic Arm Operation** – *Picking up, and placing objects with precision.*
- **Object Detection & Color Identification** – *Recognizing and responding to objects based on color.*

The competition is structured into two levels: Level 1 is the qualifying round, and Level 2 is the showdown on event day.

More than just a competition, ROBOFEST 2026 is a platform to refine engineering design skills and algorithmic thinking while fostering innovation and teamwork.

Are you ready to take on the challenge and improve your robotics skills?

1. School Category Competition Details

1.1 Eligibility

- The competition is open to school students island-wide.

1.2 Team Composition

- **Team Name:** Each team must create a unique and creative **team name** that represents their identity and innovation in robotics.
- **Promotional Materials:** Teams are allowed to design and display promotional materials that highlight their talent, creativity, and hard work.
- Teams can have up to five (5) members, all from the same school.

1.3 Registration Policy

- Each team must provide an **Official Letter** from their school confirming the current enrollment of all team members.
- The participant's names in the school letter must exactly match the names in the registration application, as these names will be used for certificates.
- Once registration closes, **no changes to team composition will be allowed under any circumstances**. This means that no names can be added, removed, or changed from a team after the deadline.
- Failure to provide the required verification will result in disqualification.

1.4 Competition Tasks

Level 1:

- **Line Following:** The robot must follow a designated path accurately using sensors.
- **Maze Solving:** The robot should navigate the dead ends and navigate to the destination.
- **Robotic Arm Operation:** The robot must operate a robotic arm to complete tasks.

Level 2:

- **Object Handling:** The robot must pick up, carry, and place a specified object from point A to point B based on **color detection** in addition to the criteria from Level 1.

1.5 Judging Criteria

1.5.1 Judging Panel

- SLIIT will provide a team of expert judges with experience in both academic and industrial fields.
- Judges will evaluate each robot based on established criteria, focusing on:
 - Engineering skills
 - Creativity
 - Problem-solving abilities
- Expert feedback will enhance the participant experience and maintain competition standards.

1.5.2 Final Competition Viva Session

- **Viva Session** to verify participants' knowledge of both **hardware** and **software** aspects of their robot.
- Participants must demonstrate an understanding of:
 - **Hardware Design:** Components, assembly, and functionality.
 - **Software Algorithms:** Logic behind the robot's actions and decision-making.
- The Viva will assess technical expertise and design explanation. Strong performance in the Viva will complement the robot's competition results.

1.6 Awards

- Teams who complete the task based on level 1 will receive an e-certificate. (The names in the registration link will be included in the certificate, and mailed to the Registered mail; no request to change the name will be entertained.)
- Teams who progress to Level 2 will receive a certificate for participation.
- Winners will receive awards and cash prizes.

2. Robot Development - Technical Specifications

2.1 Robot Body Specifications

2.1.1 Maximum Dimensions

The robot must conform to the following maximum size:

- Width: 15 cm
- Length: 21 cm
- Height: No height restriction

These dimensions include all components, sensors, and accessories, ensuring the robot fits within the competition playing field.

2.1.2 Navigation and Control

- The robot must be **self-navigating**, meaning it should operate autonomously without remote control.
- **No human interaction** is allowed after the robot is switched on until the end of the attempt.
- **Start Switch**: The robot must include a start switch, activated at the beginning of the contest to signal the start of operation.

2.1.3 Robot Structure and Design

- **Wheels**: The robot must utilize wheels for movement. A two-wheel design (as shown in Figure 1) is an example, but any wheel configuration is allowed within the size limitations.

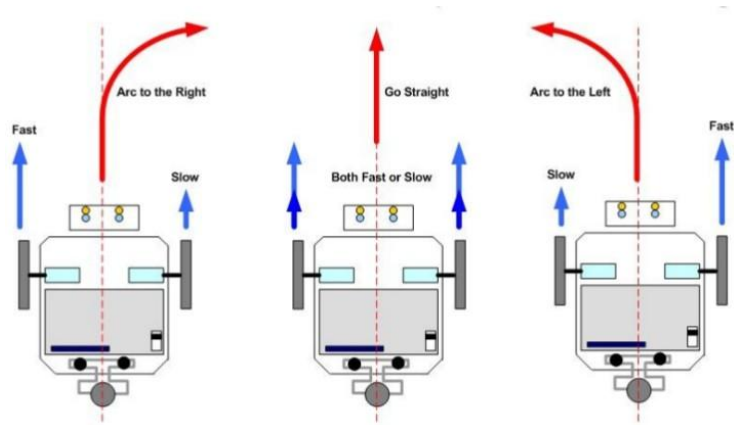


FIGURE 1: AN EXAMPLE OF HOW TO MAKE THE ROBOT TURN.

- **Design Ownership:** The robot must be entirely **designed and built by the participants**.
- **Pre-built modules** are not allowed, except for specific components:
 - **Drive Gears:** Wheels, motors, gearbox, and crane arm
 - **Sensors:** IR sensors, color sensors
 - **Microcontrollers:** Any type of microcontroller can be used, provided it is part of the custom design.

2.1.4 Power and Operation

- The robot must be **battery-powered**.
- It should be designed to work efficiently under varying **ambient lighting conditions available** on the competition playfield.
- The robot should not be hardcoded; it must use adaptable software for navigation and task completion.

2.2 Gripper Specifications

2.2.1 Crane Arm Capabilities

- The crane arm should be capable of the following movements:
 - **Gripping Movement:** The arm must be able to retract and extract the object.

- **Vertical Movement:** The arm should have the ability to move up and down to position the gripper appropriately for object manipulation.

2.2.2 Gripper Mechanism Attachment:

- The gripper mechanism must be **attached** to the robot's arm and must function as an integral part of the robot's design (Refer to Figure 2).

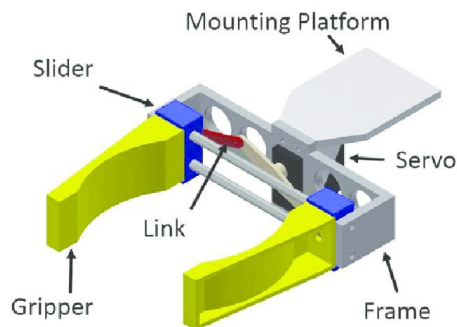


FIGURE 2: AN EXAMPLE OF A POSSIBLE GRIPPER DESIGN

2.2.3 Object Specifications

- The object to be picked up will be a **4x4x4 cm³ (+/- 2mm)** wooden cube, weighing **less than 50 g**.
- The gripper must be able to securely pick up and transport this object as part of the task.

These specifications ensure the gripper is both functional and effective in completing the object manipulation tasks in the competition.

3. Playing Field Specifications

3.1 Surface Material & Colors

- The floor will be **white (matte)**.
- All lines, the starting area, and the finishing area will be **black (matte)**.
- **Bristol board** may be used as the white background for constructing the field.

3.2 Level 1 Playing Field

- Participants must **construct the track** according to the given dimensions (as shown in Figure 3).

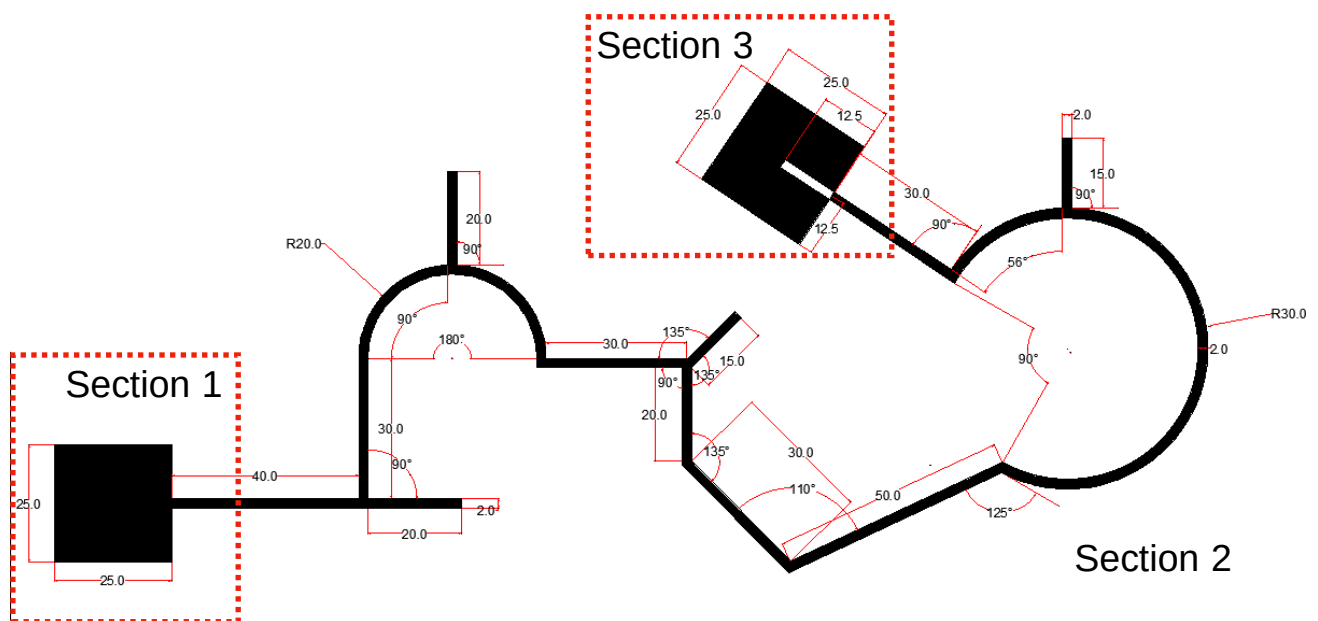


FIGURE 3: LEVEL 1 PLAYING FIELD (ALL MEASUREMENTS ARE IN CENTIMETERS)

3.2.1 Section 1 – Line Following

- The robot will start from a **25 cm x 25 cm** black starting square.
- It must follow a 2 cm wide black line (insulation tape or black matte tape) to reach the end of Section 1.

3.2.2 Section 2 – Line Maze Solving

- The maze consists of curves, angular turns ($\leq 90^\circ$), and dead ends.
- The robot **must always follow the black line** and solve the maze using any algorithmic technique.

3.2.3 Section 3 – Finish Area (Level 1)

The robot must transition to a **2 cm wide white line** and stop automatically upon reaching the finishing area (Figure 4).

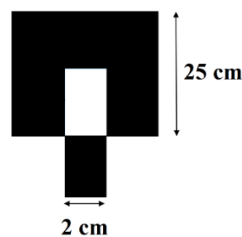


FIGURE 4: FINISHING AREA IN THE LEVEL 1

3.3 Level 2 Playing Field

In **Level 2**, participants will compete on a **modified playing field** that incorporates a **pick-and-place task with color detection** and the navigation challenges from **Level 1**. (Only Specifications in section 3.2.3 will change).

3.3.1 Level 2 Task Specification

- A **solid black square** (similar to the starting block in Figure 5) will indicate the **object pick-up area**.
- The robot must **detect the black square**, identify the **box color**, and pick up the object.
- The robot must navigate to the designated drop-off zone based on the predefined directions provided for each color.
 - Red cube → Left drop-off zone
 - Blue cube → Right drop-off zone

- After successfully placing the object in the correct drop-off zone, the robot must **return to the pick-up area**, marking the completion of the task.

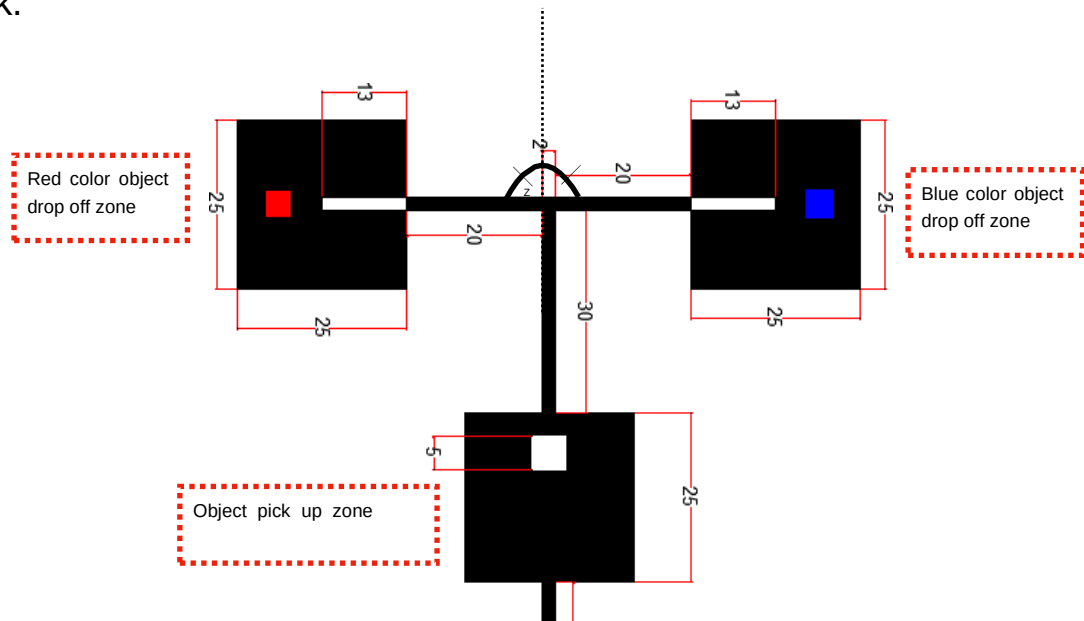


FIGURE 5: FINISHING AREA IN LEVEL 2 (ALL MEASUREMENTS ARE IN CENTIMETERS)

3.3.2 Section 3 – Finish Area (Level 2)

- The angle z will be within the range $0^\circ < z \leq 90^\circ$.
- **Figure 5** provides a **simplified summary** of the pick-and-place competition. It is for reference only and does not represent the actual playing field.
- The **picked-up box** can be **placed anywhere within the designated drop-off zone**.
- The object to be carried is a wooden cube weighing less than 50 g.

4. Evaluation Criteria

4.1 Level 1 (Online Video Submission)

4.1.2 Submission Compliance Check

- All submissions will be reviewed to ensure they adhere to the competition guidelines before being forwarded to evaluators.
- Submissions that fail to meet the guidelines will be **desk-rejected** and will not proceed to evaluation.

4.1.2 Evaluation Process

Each submitted video will be assessed by at least two evaluators. The evaluation will be based on the following criteria:

- Line Following Accuracy – The robot must follow the line smoothly without significant deviations.
- Maze Navigation – The robot must correctly identify and navigate dead ends.
- Robot Arm Operation –
 - Level 1: The gripper's extraction and retraction and the up and down movement of the robotic arm will be evaluated (Use a sample object to demonstrate the operation).

4.2 Level 2 (Final Round - Physical)

1. **Navigation Accuracy** – The robot must effectively follow the designated path while adapting to course modifications.
2. **Time Efficiency** – The time taken to complete the task will be considered.
3. **Completion Time & Attempts** – Robots will be allowed a **maximum of 10 minutes** and **3 attempts** to successfully complete the challenge.

4. Engineering Design & Construction – Evaluation based on:
 - **Structural Integrity & Stability** – The design should be robust and well-assembled.
 - **Resource Optimization** – Efficient use of components and energy.
 - **Performance Reliability** – The robot should function consistently under competition conditions.
 - **Pick-and-Place Performance** – Assessed based on:
 - **Object Pickup Efficiency** – Number of attempts and time taken to grasp the object.
 - **Gripping Mechanism Effectiveness** – The ability of the robot to securely hold the object.
 - **Object Placement Accuracy** – Number of attempts and precision in placing the object in the correct drop-off zone.
5. **Viva Session** – Knowledge Verification - Participants must demonstrate their knowledge in the following areas:
 1. **Hardware Design**
 1. Identification and explanation of key components.
 2. Assembly process and structural design.
 3. Functionality of each component and its role in the overall operation of the robot.
 2. **Software Algorithms**
 1. Explanation of the logic behind the robot's actions.
 2. Decision-making processes implemented in the code.
 3. The adaptability of the algorithm to different playing field conditions.

5. Guidelines for the School Category Competition

5.1 Registration Link

Link - [ROBOFEST 2026 REGISTRATION - SCHOOL CATEGORY – Fill in form](#)

5.2 Level 1: Video Submission Specifications

Participants must submit a video demonstrating their robot's functionality according to the following guidelines:

- **Duration:** The video should not exceed **5 minutes**.
- **File Size:** The maximum file size allowed is **150 MB**.
- **Visibility:** The entire **playing field** must be visible throughout the video.
- **Initial Display:** The first **30 seconds** should clearly show the full playing field without the robot.
- **Robot Dimensions:** Before starting, the robot must be placed in the **starting area**, and its **length and width** must be measured using a ruler.
- **Continuous Footage:** The robot must remain **fully visible** from the start to the end of its navigation.
- **Robot Arm Demonstration:** A separate segment in the video should showcase the **robot arm's functionality**, including gripper extraction, retraction, and arm movement.
- **File Format:** The accepted format is **.mp4**.
- **File Naming:** The video file should be renamed as **RFSC26_xxx**, where **xxx** is the group number (contest numbers will be assigned after registration closes).
- **Upload Location:** The video must be uploaded to the **registered email's Google Drive**.
- **Link Submission:** Only a direct link to the video file should be shared. Folder links will not be accepted.

- **Access Permissions:** Participants must ensure that the video link is **accessible** to evaluators by enabling "**Anyone with the link can view**" in Google Drive settings.

Failure to comply with these specifications may result in disqualification.

5.2 Level 2: Final Round

- Dress Code: All team members must wear their school uniform. School club T-shirts are not allowed.
- Supervision:
 - Teams **must** be accompanied by a **teacher in charge** and a **parent**.
 - **Individual participants** (one-member teams) may be accompanied **only by a parent**.
- Specific instructions for the final event will be sent **only to the finalists** after the announcement of the selected teams.

Event Coordinators

Following are the event coordinators for the ROBOFEST 2026 School Category.

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