



KOTELAWALA DEFENCE UNIVERSITY  
STUDENT CHAPTER

Institution of  
**MECHANICAL  
ENGINEERS**

# ROSCo

ROBOTICS SHOWDOWN COMPETITION

# TECHNICAL SPECIFICATIONS

# INTRODUCTION

**RoSCo, robotics showdown competition, highly anticipated robot competition organized by the IMechE Student Chapter and the ERIC Club of General Sir John Kotelawala Defence University.** This intra-university competition provides an exciting platform for students to showcase their robotics skills and innovative designs. Open to all university students, this competition promises to be a thrilling test of autonomous robot capabilities.

**We encourage all students with a passion for robotics to participate in this thrilling event, where you can unleash your creativity, technical skills, and teamwork. Get ready to witness the convergence of innovation and competition as the robotics enthusiasts at General Sir John Kotelawala Defence University showcase their talents in this eagerly awaited robot competition.**

**May the best robots prevail!**

# THE COMPETITION TASK

The competition features a line-following challenge. Participants will navigate their robots through a specially designed course, aiming to complete it in the shortest possible time. The precise combination of speed, precision, and decision-making will determine the winners, making every second count!

The line following introduces a different set of challenges. Participants will need to program their robots to accurately follow a predetermined line, considering turns, curves, and intersections. It's a true test of both programming prowess and engineering finesse.

So, participants will need to balance speed and precision to secure their positions on the leaderboard.

# ELIGIBILITY AND REGISTRATION

- All university students are eligible to participate.
- Registration should be completed within the specified deadlines.
- Teams should be formed according to the guidelines provided.

# RULES

- 1. Robots and teams should be as specified in the document to qualify for the competition.**
- 2. Robots from the qualified teams will be only allowed to participate in the competition.**
- 3. Robots should be presented before the competition starts on both days.**
- 4. All teams will have 2 attempts on the first day. The Robot should complete the task within 5 minutes otherwise the attempt is lost.**
- 5. Time is counted from the instance the Robot is placed on the arena in each attempt.**
- 6. Placing; - Robots should be always placed on the start square shown in the arena and switched on manually.**
- 7. After placing, picking up or any human intervention can end each attempt.**
- 8. Robots should follow the game rules.**
- 9. Robots can be taken out by the judge board if it's harming or if it has the potential to harm the arena by ending the attempt.**
- 10. Any unsportsmanlike conduct may result in disqualification.**
- 11. 10 best teams from the first day will be qualified for the second day of the competition.**
- 12. All teams will have 2 attempts on the second day. The robot should complete within 5 minutes otherwise the attempt is lost.**
- 13. The judging board does all the scoring and ranking, and the judge board call is the final.**
- 14. Any violation of the above rules will be punished by disqualification.**

# COMPETITION TASK SPECIFICATION

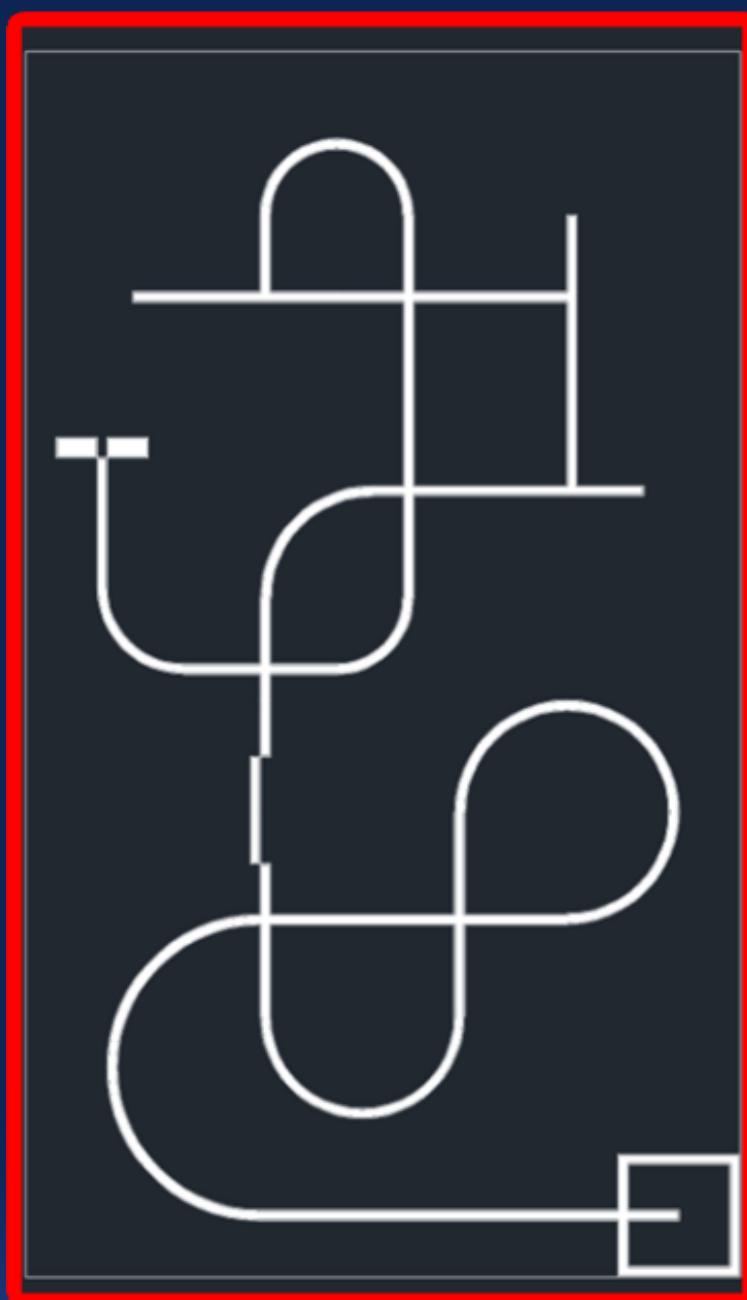


Figure1: Sample Arena

# GAME RULES

## Line Following

- **Robots should follow the white line on a black surface, which includes curves, turns, junctions, dead ends, and variations. (The width of the line is 2.5+-0.1cm (1").)**
- **Robots should stay within the boundaries of the line and complete the track without any human intervention. Attempt will be lost if the robot deviates significantly from the line.**
- **Robot should take the straight path when it comes to a junction.**
- **At the first junction after a dead end the robot should take a path that is not straight (there will be only T junctions after a dead end).**
  - **The first dead-end type of the path is denoted by the pattern in the surface in Figure 2.**
  - **The second dead-end type is a wall in the middle of the line shown in Figure 3. (Wall is 10+-0.5cm tall and 12cm wide.)**
- **The robot should stop at the end position.**
  - **The end of the line following is denoted by a pattern in the surface as shown in Figure 4.**
- **Sensing the line can't be done in a way that harms the arena.**



Figure 2



Figure 3

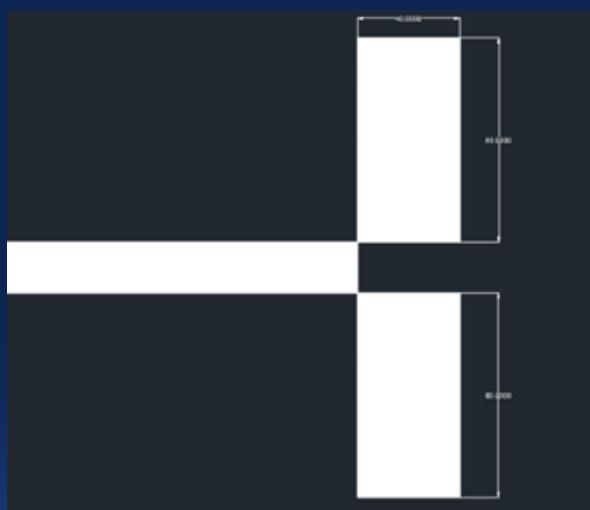


Figure 4

# ROBOT SPECIFICATIONS

- **Robot dimensions:** Length and width should not exceed [20x20] cm.
- **No height limitations.**
- **No limitations on the number of sensors and actuators.**
- **Robots must be fully autonomous** [robots can't be manually or remotely controlled].
- **Robots must not include components that could damage the arena.**
- **Robots must not leave behind or deposit anything in the arena.**
- **Robots must remain intact and cannot split into parts.**
- **No leaks of fluids from the robot are permitted.**

# SCORING AND RANKING

- Scores are calculated based on the time taken to complete.
- Robots cannot damage the arena.
- Rankings are determined by the least overall score.

# TEAM FORMATION

- Create a team with a maximum of four members.  
Solo entries are also accepted.
- All the team members should be from the same intake and same faculty.