Line Follower – Rulebook

General Guidelines:

- Competition will be held on 19th Oct 2025.
- There will be check-in for the participants.
- Track will be published only at the venue.
- Basic raw codes(eg: Movement functions & other task functions) could be created beforehand.
- Teams will be given 2 hours before starting competition for modifying their raw codes according to the track condition and tasks.
- You could use any microcontroller.
- The battery pack should be onboard and maximum permissible voltage is 12V.

Track Specifications:

• Track Material: Flex printed banner (Matte finish)

• Track Type: Closed loop

• Color: Black line (sharp contrast) on a white background

• Line Width: 2.5 cm ± 0.2 cm

• Track Complexity:

- ❖ Curves: Minimum radius 20 cm
- ❖ Corners: Minimum angle 90 degrees
- ❖ Junctions: T-junctions and cross-sections
- ❖ Dead Ends: Not included
- ❖ Dashed tracks: Maximum 5 cm in some sections.

Tasks Included:

- To rotate bot 360 degrees
- Light up red, yellow and green leds
- Stop the bot for 5 seconds
- Reverse traversing the bot to last checkpoint
- Track includes 90 degree turns, bends, zig-zag and shapeless track

3. Robot Specifications:

- Maximum Dimensions: 20 cm × 20 cm × 20 cm (LBH)
- Maximum Weight: 1.5 kg
- Power Source: Battery-operated only (No AC power, Max 24V)
- Chassis Material: No restrictions (plastic, metal, 3D printed, etc are allowed)
- Wheel Type: No restrictions, but should not damage the track
- Sensors: Any
- Motors Allowed: Any
- Control System:
    - ❖ Fully autonomous operation required
- Microcontroller Restrictions: Any 32-bit processor or lower than that is allowed.
- Use of GPU and MMU is prohibited. (Arduino, Raspberry Pi, STM32, etc are allowed).
- Processing Limits: No external computing (Laptop/PC not allowed during the run)
- Wireless Communication: Strictly not allowed (Robot must be autonomous)

4. Mandatory Components:

1. Red led
2. Yellow led
3. Green led

5. Scoring Criteria:

1. Bots are expected to complete all the tasks and also perfect line following from starting till the end.
2. Each team will be provided 10 minutes to complete the track with whole tasks.
3. Track will be assigned as several sections and there will be separate points for completing each section.
4. There is no problem in skipping any tasks but no task points will be awarded.
5. The leaderboard will be set up according to the points gained.
6. If any tie in points occur then time will be the deciding factor, fastest bot which finishes will secure higher position.
7. If needed 2 debugging times of 10 minutes will be provided for modifying the code.
8. If debugging time is used, for each debugging time a penalty of 15 points shall be reduced.
9. After debugging the bot shall start from where it was taken.
10. After starting the competition, if any physical intervention is noticed then a hand touch penalty of 10 points shall be reduced for each hand touch.
11. Task points will be as follows:
    - Turning on each light - 30 points
    - Successfully travelling through each section - 20 points
    - Stopping 5 second - 15 points
    - 360 degree rotation - 40 points
    - Reverse travelling - 40 points
    - Successfully stopping at the finishing point - 50 points

**Timings are prone to change

**All rules and regulations are subjected to changes by organizing committee

5. Judging Criteria:

- Time: Fastest completion time.
- Timing procedure: Automated measurement.

6. Penalties & Disqualifications:

- Off-Track Behavior:
    - ❖ Minor Off-Track Deviation: Robot must correct itself before getting out of track.
    - ❖ Major Off-Track (Full Exit): Restart required with time penalty
- Robot Size Exceeded: Not allowed to compete.
- Robot Damages the Track: Disqualified

Appendix:

1. Pitch: The distance from the center of the path to center of the path nearest to it.
2. T- junctions: On the T- junctions the robot can take either left or right turn, both paths will be symmetric.
3. Cross-sections: At the cross-sections, the robot should take the straight path.
4. Dashed path: The path can be broken in between; your robot should be able to traverse through it.
5. Excessive overshooting: Will be the judge's call.
6. Time penalty: The timer will not be stopped in the due time.

*Throughout the contest all decisions will be taken by the judges.