



# Universal Robo League

POWERED BY ROBOMATIC



**ROBOMATIC**  
— A STREAM BASED EDUCATION —

## **ABOUT THE ORGANIZATION**

### **ABOUT US**

ROBOMATIIC is an Educational, Research & Development organization. We are providing Robotics education at Schools / Colleges in **STREAM EDUCATION** and also providing the new product development and industrial solutions in the sector of Industry 4.0.

We provide highly effective Robotics Education through its integrated curriculum materials and equipment that engage and create a passion towards STREAM fields i.e., Science, Technology, Robotics, Engineering, Arts and Mathematics. All programs are result oriented; research and inquiry based and which are all aligned perfectly on International standards. STEM & STEAM are an inevitable concept implemented across 100+ countries. We offer STREAM based courses which have been designed to explore knowledge of students in the field of Science, Technology, Robotics, Engineering, Arts and Mathematics from a young age, to develop inclination towards these subjects and to experience the real world applications eventually to develop the problem solving skills.

We aim to produce the next generation innovators and problem solvers for the world through our unique offerings through our Omni channel presence. Our customised robotic training offers many advantages over the standard approach. Every theory portion of the course is followed by hands-on activity using simulation software and multiple versions of OEM robotic equipment so that each student builds confidence in their ability to navigate and work efficiently on whatever application they may encounter.

### **Why Us?**

We understand the importance of being capable of solving and troubleshooting robotic equipment issues in a timely manner, especially when it disrupts production. That's why each class at Robomatiic is designed to prepare you for what you see and experience out. We want you to walk away from these courses knowing that you can apply what you just learned to your own operations.

Instructors evaluate each student by verifying their work done, accomplish all hands-on written and lab exercises assigned, perform robot testing and recovery procedures, and conduct the pre-test and post-test.

Students and management / Parents know exactly what is learned by comparing pretest and post-test scores, plus course evaluations will let you know how the classes were received and if there are any areas for improvement.

Our teaching philosophy is quite simple: to offer a training curriculum that ensures students' success. From routine selection and cycling to the lesser known yet equally important mastering methods, each class covers application specific processes, troubleshooting techniques, and common procedures.

Looking for something even more specific? We may be able to help.

# UNIVERSAL ROBO LEAGUE

## About the Event

Universal Robo League is a prestigious national-level technical competition that brings together the brightest young minds from schools and colleges across the country. Our mission is to inspire and nurture a passion for Robotics, Drone, Science and Technology among the youth, fostering innovation and creativity while promoting teamwork and problem-solving skills. At Universal Robo League, we envision a future where technology and innovation are harnessed for the betterment of society. We strive to empower the next generation of inventors, engineers, and scientists who will lead the way in shaping a brighter tomorrow.

## Category

Junior Category is specifically designed for school students, this category provides a platform for young innovators to explore their passion for Robotics, Drone, Science and Technology. College students have the opportunity to compete at a more advanced level, pushing the boundaries of what's possible in the world of Robotics, Drone, Science and Technology.

## Skills Development

Universal Robo League equips participants with practical skills in Robotics, Drone, Science and Technology, preparing them for future careers in technology and engineering. We encourage participants to think outside the box, fostering creativity and out-of-the-box problem solving.

## Teamwork and Networking Opportunities

Our competitions emphasize teamwork, teaching participants how to collaborate effectively with others. Participants have the chance to connect with like-minded individuals, mentors, and industry experts, expanding their horizons and opportunities.

## Recognition and Motivation

Outstanding performers will receive awards, Gift Vouchers, and recognition for their achievements, motivating them to excel further. We also aim to celebrate and recognize the achievements of outstanding participants, creating a supportive community that sustains

interest in emerging technologies well beyond the event. Furthermore, we emphasize inclusivity and diversity, inviting students from all backgrounds to join us on this educational journey.

### **Inclusivity and Diversity**

Ultimately, our goal is to instill a love for lifelong learning, ensuring that the event leaves a lasting impact on the students and the community it serves.

The vision for Universal Robo League is to inspire and equip the next generation of innovators, engineers, and scientists with the skills, creativity, and collaborative spirit needed to harness technology and innovation for the betterment of society. We aim to foster a community of diverse talents, celebrate achievements, and promote lifelong learning, ultimately driving positive societal impact and shaping a future where technology is a force for positive change and progress.

## **RULES AND REGULATION**

### **RULES AUTHORITY**

There are several rules and restrictions, which are to be followed by each and every team. Robomatiic reserves the right to modify each and every rule associated with the event. Violation of rules by anyone of the participating member may be liable to be penalized severely, inclusive of and up to debarring of the team from the competition at any stage or withdrawal of award/awards, as well.

### **VALIDITY OF THE RULES**

The rules will be same throughout the event and any amendments will immediately be made known to all the participating teams through emails and the same will be uploaded on the website [www.robomatiic.in](http://www.robomatiic.in)

### **RULES COMPLIANCE**

By registering for this event, the team, members of the team as individuals, faculty advisors and other personnel of the School/College/University agree to comply with and will be bound by these rules, interpretations or procedures issued or announced by Robomatiic. All team members, faculty advisors and other university representatives are required to cooperate with, and follow all instructions, penalties and results from competition organizers, officials and judges.

### **LOOPHOLES**

It is virtually impossible for a set of rules to be so comprehensive that it covers all possible questions about the project and its parameters or the conduct of the competition. Please keep in mind that safety remains of paramount importance during the Event, so any perceived loopholes should be resolved in the direction of increased safety/concept of the competition.

### **VIOLATIONS OF INTENT**

The violations of intent of a rule will be considered a violation of the rule itself. Questions about the intent or meaning of a rule may be addressed to the organizers

## **BEHAVIORAL ATTITUDE**

### **UNSPORTSMANLIKE CONDUCT**

In the event of unsportsmanlike conduct, the team will receive a warning from an official. A second violation will result in expulsion of the team from the competition. Failure of a team member to follow an instruction or command directed specifically to that team or team member would result in a penalty card.

### **ARGUMENTS WITH OFFICIALS**

Argument with, or disobedience to, any official may result in the team being eliminated from the competition. All members of the team may be immediately escorted from the grounds.

## **PARTICIPANT ELIGIBILITY**

### **INSTITUTION ELIGIBILITY**

Institutions (schools) that follow Indian standard of education system and fall under

- State Boards
- Central Board of Secondary Education (CBSE)
- Indian Certificate of Secondary Education (ICSE)
- Council for the Indian School Certificate Examination (CISCE)
- National Institute of Open Schooling (NIOS)
- International Baccalaureate (IB)
- Cambridge International Examinations (CIE)

### **STUDENTS ELIGIBILITY**

Students studying under these institutions

- School Students studying in the **grade of 5 - 12 (or) age of 10 - 17 years**

# Innov8 Students Challenge

## About the Innov8 Students Challenge

The primary objective of the event is to promote STREAM education among school students. We aim to ignite a passion for STREAM - Science, Technology, Robotics, Engineering, Arts, and Mathematics by showcasing projects that align with these fields. In doing so, we hope to encourage creativity and innovation among the young minds participating in the event, allowing them to explore unique project ideas while developing crucial problem-solving skills.

The event will provide students with a platform to enhance their presentation and communication skills, essential attributes in today's competitive world. Through collaborative learning experiences, we intend to foster teamwork and highlight the interconnectedness of STREAM disciplines. Moreover, by introducing students to potential career paths in these fields, we aspire to inspire their academic and professional pursuits.

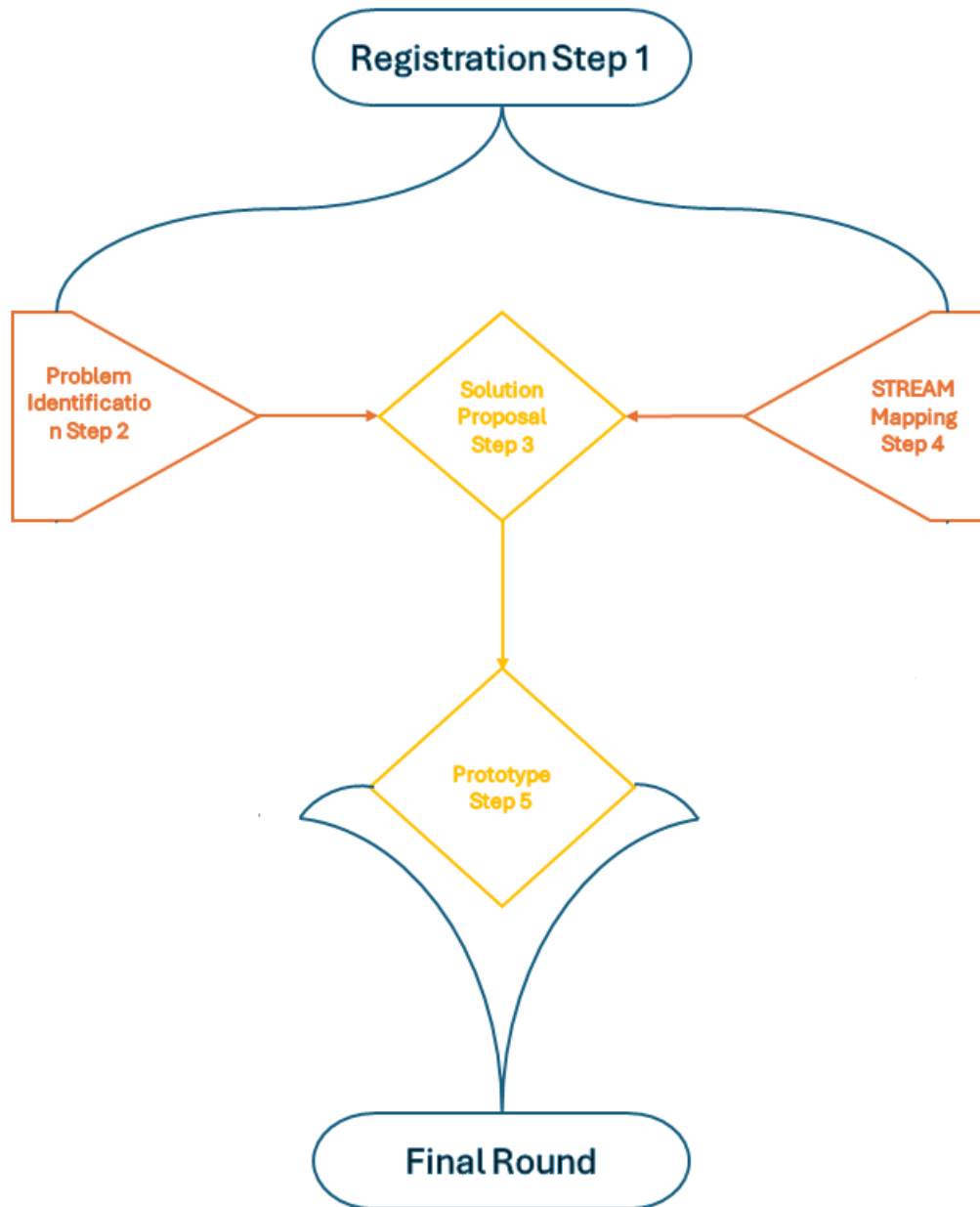
We also aim to celebrate and recognize the achievements of outstanding participants, creating a supportive community that sustains interest in STREAM education well beyond the event. Furthermore, we emphasize inclusivity and diversity, inviting students from all backgrounds to join us on this educational journey. Ultimately, our goal is to instill a love for lifelong learning, ensuring that the event leaves a lasting impact on the students and the community it serves.

## Themes for the Contest

Main Themes	Sub Themes
Science Technology Robotics Engineering	Agriculture, food tech and rural development Clean and green energy Disaster Management Renewable/sustainable energy Robotics and drones Smart Automation Smart Vehicle Transportation and logistics



## Process Flow Diagram



## School Registration

1. School REGISTRATION is open on the **ROBOMATIIC website - [robomatiic.in](http://robomatiic.in)** any school can nominate their teams through the portal. This STREAM Contest is for **Grade 5<sup>th</sup> to Grade 12<sup>th</sup>** students.
2. **SPOC** (Single point of contact) is the person (Principal / Vice principal / Registrar / Any senior faculty nominated by the principal) who will represent the school and carry out the registration process.
3. Each team nominated by the SPOC can have a Maximum of **2 members**. Each team can have their Maximum of 1 team mentor (optional) (The mentors could be teachers / parents)
4. **SPOC / Mentor** can guide more teams if required.

## Team Formation

1. A team can be formed with a maximum of **2 students** and **1 Mentors** (which can be optional) (can be teachers / parents)
2. Both the students within a team should be from the **same school**. Inter-school teams are not allowed.
3. Integration of classes on teams is allowed. All members in a team can be of various grades.
4. **Team Name** should be **unique** and should not contain the name of their **institute in any form. (Example - Inquisitive Minds, Brainiacs, Lab rats)**

## Working on Problem Statement

### Open innovation:

Teams can work on any Problem Statements of their own. Students can come up with their own model based on the **theme**.

### Submission of Ideas:

The SPOC have to register the selected teams on the **ROBOMATIIC website - [robomatiic.in](http://robomatiic.in)** along with the following details

1. Team Name.
2. Name, gender, Email id, Mobile No. (parents Mobile No. or Faculty Mobile No.) of all members of a team.

3. School Authorization Letter (**Bonafide Certificate**).

### **Mentoring and Evaluation Sessions:**

1. During the **mentoring session** the team members can interact with the judges and representatives from the organizations gaining valuable feedback on the **progress of their work** and how it can be improved.
2. For the Evaluation session, the teams had to give a **complete walkthrough** of their **application/prototype** developed during this event.

### **Judging Criteria**

1. Creativity & Innovation
2. Critical Thinking & Problem Solving
3. Interdisciplinary approach of project (Science, Technology, Robotics, Engineering, Arts)
4. Presentation Skill

# Fastest Line Follower

## Registration and Team Formation

- A match is played by a **single team** in one go, with each team consisting of **1 Wireless Bot**
- Construct a team **maximum of 4 members**. Any institution (**Only Schools**)
- Register team for the specified competition online on the [official ROBOMATIC website](#) only.
- Construct a wireless autonomous Bot. Ready-made bot will not be allowed to compete

## Line Follower Bot Parameters

The participating bots should be wireless and should not be controlled. It can be circular / Rectangular in style. Bot must fit inside a **30 centimeters** wide and **30 centimeters** high cube at any point in time. Maximum weight should not be more than **3Kgs** (including battery. However, a tolerance of **5%** is acceptable.).

Participants need to ensure:

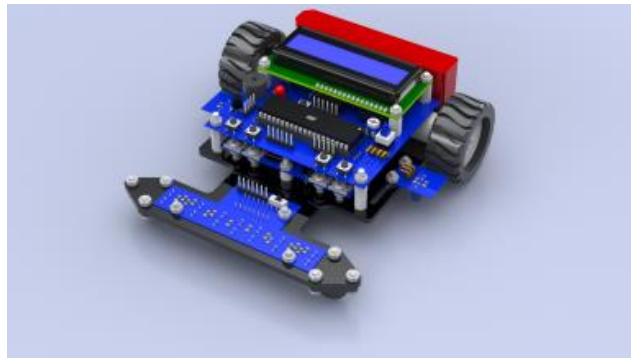
- Batteries must be **sealed**, immobilized electrolyte type (gel cell, lithium, NiCad, or dry cells).
- The electric voltage anywhere in the machine can be used up to **24V DC** at any point in time for each robot.
- **Infrared light-reflecting materials must not be used on the outside**. If robots are painted, they must be painted matte. Minor parts that reflect infrared light could be used only if other robots are not affected. Robots must not produce magnetic interference for other robots on the field.
- The robot must be **autonomous**
- No wireless communication between bot and operator will be allowed. Bluetooth, RF Module, etc. not allowed on bot.
- Robots must be constructed and programmed in a way that their movement is not limited to only one dimension and must move in all directions.

- Visible space for pasting **approval stickers/tags by organizers** of the competition is to be allocated on the robot
- Any robotic parts/building material can be used until the robot meets the above specifications and if the design and construction are primarily the original work of the team as ready-made robots are not allowed to compete in the competition.

### **Racing Track:**

The Racing track of the Fastest Line Follower challenge has a track of a total arena dimension of **10x10 Sq.ft.** The width of the black line will be **25mm.** The surface of the track will be white with a black line marked on it. The track may contain crossed, curved, or discontinuous black lines.

### **Demo Robot**



## Gameplay:

The robot will be placed at the starting point with the consent of the referee.

- Bot may restart the run if the person handling it feels the necessity. A restart can be requested only if the robot doesn't follow the line, has stopped halfway, or has lost the directions/Black line.
- At any restart, the robot must be re-positioned back at the start point.
- It is not allowed to reprogram the robot or to add/remove parts on the robot during the run, but adjusting the sensors is permissible with the consent of the referee.
- The RACE CLOCK/RUN TIME will reset to zero on every restart. The COMPETITION CLOCK (maximum access time) will keep running during all restarts.
- Only 3 restarts are allowed for each round. A robot must restart if bot does not start after pressing the Start Button for 30 Seconds, bot is touched by a human without the consent of the referee, bot moves out of the arena or the referee orders it to restart.
- There will be two rounds in Fastest Line Follower gameplay i.e. **Elimination round** and a **Final round**

## Elimination Round:

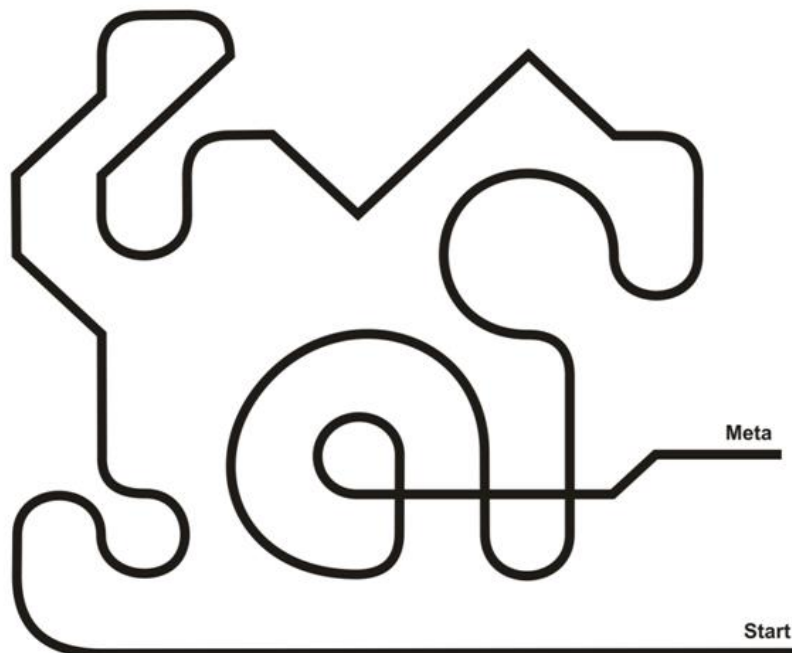
- Every team will be given 1-minute time to calibrate the bot and maximum 3 minutes for game play. 1 minute of calibration time will not be included in gameplay time.
- If Bot loses the track, bot operator can touch bot maximum 3 times during the overall gameplay in all trials.
- Within 3 minutes of gameplay duration, the team will get a maximum 3 trials. Minimum time will be considered in all 3 trials.

## Final Round:

Qualified teams will compete in this round to achieve the minimum runtime. A single run will be conducted for each qualified team. Teams with the minimum runtime will be nominated as the winner of the competition.

- Team would be given 1 minute for calibration and maximum 5 minutes for gameplay.
- If Bot loses the track, bot operator can touch bot maximum 3 times during the overall gameplay in all trials.
- Within 5 minutes of gameplay duration, the team will get a maximum 3 trials. Minimum time will be considered in all 3 trials.
- Winners would be selected based on who reached the finish line in minimum time duration.

## Sample Track:



# Robo Race

## Registration and Team Formation

A match is played by a **single team** in one go, with each team consisting of **1 Wired or Wireless Bot**

- Construct a team **maximum of 4 members**. Any institution (**Only Schools**)
- Register team for the specified competition online on the [official ROBOMATIIC website](#) only.
- Construct a Wired or wireless autonomous Bot. Ready-made bots will not be allowed to compete

## Bot Parameters

The participating bots should be wired or wireless and controlled remotely. It can be circular / Rectangular in style. Robot must fit inside a **30 centimeters** wide and **30 centimeters** high cube at any point in time. Maximum weight should not be more than **5Kgs** (including battery for wirelessly controlled bots. However, a tolerance of **5%** is acceptable.).

Participants need to ensure:

- Batteries must be **sealed**, immobilized electrolyte type (gel cell, lithium, NiCad, or dry cells).
- The electric voltage anywhere in the machine can be used up to **24V DC** at any point in time for each robot.
- **Infrared light-reflecting materials must not be used on the outside**. If robots are painted, they must be painted matte. Minor parts that reflect infrared light could be used only if other robots are not affected. Robots must not produce magnetic interference for other robots on the field.
- The robot can be **autonomous** or **manually controlled** using a **Remote-control system**.
- Robots must be constructed and programmed in a way that their movement is not limited to only one dimension and must move in all directions.
- Any robotic parts/building material can be used until the robot meets the above specifications and if the design and construction are primarily the original work



of the team as ready-made robots are not allowed to compete in the competition

### **Race Track:**

- The Racing track has 1 bot lane of a total length of 50 - 55 Ft (approximately) with a dimension of 10ft x 10ft arena.
- The track would be 35cm wide.
- The surface and course line may have unevenness as well as different hurdles will be there on the race track trying to slow down the Bot.
- Predefined Obstacles for the competition will included

### **Gameplay:**

Each round would have a maximum 5 minutes racing time and 2 minutes for readiness. Readiness time will not be included in racing time. All bots are expected to complete all the tasks on the track.

There will be three checkpoints in which the bot has to perform some tasks and cross the zone. Completion of each task will carry 25 points. 75 points will be awarded for the bot for the completion of all the three tasks. Additional 25 points will be awarded if the bot completes the Lap.

Each run will start from the starting point. The operator may abort a run at any time. Each team will get a maximum 3 chance to touch the bot in each round. If an operator touches the robot during a run, the team will start from the previous checkpoint. During the run, the team may change batteries or fix minor technical issues.

**Game Lap:** Only One bot will be playing at a time. Team schedule would be announced before competition day. The run timer will start when the front edge of the robot crosses the start line and stop when the front edge of the robot crosses the finish line. Timings will be noted for the completion of the entire lap by the bot along with the checkpoint tasks

### **Determining the winner:**

Minimum Timing spent on the race track and Completion of tasks will be considered for points. Team with maximum points and minimum timing for the completion of lap will be considered as the winner. If there is a tie, bots will have to go two laps continuously, One with all the tasks and another without tasks.

### **Race bot:**

