



SGT UNIVERSITY
Shree Guru Gobind Singh Tricentenary University





SYNERGY 2024

FACULTY OF ENGINEERING & TECHNOLOGY

with

Torque & Code Club

ROBOTIC COMPETITION

 16TH OCT - 17TH OCT 2024 |  10:00 AM - 4:00 PM

VENUE: SPORTS GROUND, SGT UNIVERSITY

ROBOTICS EVENTS

1. Obstacle Course Challenge
2. Robbo Soccer
3. Sumo Robot
4. Innovation Round

College/University category and School category prizes upto 1,52,000/- to be won.

Participation and winner certificates to be awarded.



Robotics Competition

Overview & Objective

Robotics is the present and future of industrial world. Anything that can be automated will be automated and Robotics is a crucial aspect or component in today's technological era. This competition aims at providing students a platform to apply their knowledge in the field of Robotics and do it while having fun. A competitive environment motivates new thinking, concepts, designs etc. Keeping this in mind the events in this competition are designed in such a way so as to cover all the practical aspects while developing a robot. The contesting teams will participate in different events with their Robots and the teams will be given marks based on their performances. The events will be judged by a panel of highly qualified judges who will make judgement based on different parameters for different events.

NAME OF THE COMPETITION: Robot Arena 2.0

ORGANIZED BY: TORQUE Club, FEAT, SGTU

DATE: SYNERGY, 2024

VENUE: Sports Ground, SGT University

LAST DATE OF ONLINE REGISTRATION: 15th October 2024 (On the spot registration also allowed)

REGISTRATION FEE: Nil

Event Description:

- i) **Sumo Robot:** Robots compete in a sumo ring, aiming to push their opponents out of the circle.
- ii) **Obstacle Course Challenge:** Robots must navigate a series of obstacles, including hurdles.

Evaluation Model Sumo Robot:

The judges will give marks to each team for their performance and declare the winners. Evaluation model will be explained on the spot. The basic target will be pushing the opponents bot outside the ring.

Evaluation Model Obstacle Course Challenge:

The judges will give marks to each team for their performance and declare the winners. Each hurdle will carry certain points and so separate points will be awarded for overcoming the hurdles. Time of completing the race will be the factor to decide winner, if multiple robots cross all hurdles. Otherwise, the robot with the maximum cumulative points will win the race. A predefined set of points will be awarded to top three performers only, in this event.

Event Description:

- iii) **Robo Soccer:** In this event Robots will compete on an arena specially designed for robotic soccer match. The event is aimed at testing the manoeuvring skills and the control of the robot. A specific number of robots will play simultaneously but against each other and try to score points in the form of goals (Pushing the ball in a specific confined space), using their robots. Format of the match and timings will be disclosed on the day of competition.

Evaluation Model:

The judges will give marks to each team for their performance and declare the winners. Each goal will carry certain points. Time of scoring goals will also be a factor in certain formats of this event. The robot with the maximum cumulative points will win the event. A predefined set of points will be awarded to top three performers only, in this event.

Event Description:

- iv) **Robo innovation:** The creativity and innovativeness would be measured from the perspective of structural and operational aspects of the model, its social impact and application areas. The evaluation for this would be based on presentation by the teams. It will be a knowledge test for the team members and a test of their original ideas.

Final Result & Prizes:

The judges will give marks to each team based on their presentation, uniqueness and extent of social impact and declare the winners. The markings will lie entirely in the hands of experts judging this event. A predefined set of points will be awarded to top three performers only, in this event.

Result Declaration:

There will be three prizes for the three highest scoring teams in this competition along with few consolation prizes and participation certificates. The obtained points by respective teams from all the above mentioned 5 events will be summed up to decide the top three performers. The proposed prizes for the event are (The prize money can be changed by higher authorities as per their expert understanding):

- a) First prize...Rs 16,000/- (College category) & Rs Rs 16,000/- (School category)
- b) Second prize... Rs 12,000/- (College category) & Rs... Rs 12,000/- (School category)
- c) Third prize.... Rs 10,000/- (College category) & Rs Rs 10,000/- (School category)

Certificates of appreciation will also be awarded to the winners.

Candidature of Participants

1. Must be a regular student of a recognized Institute by State/Central Educational Governing Body.
2. Team size: Maximum 3 members with valid I-Cards of their respective Institution.

Robot Specifications

THE ROBOT:

- The robot participating in the competition can be wired/wireless, autonomous or manual.
- Lego kits are strictly prohibited. The robot must not be made from any ready-made kit, if found so, the team will be disqualified.
- The Robot must be non-destructive and non-harmful to humans and the track or the arena.
- Radio systems MUST NOT cause interference to other radio-frequency users.
- The length of the wire (for wired bots) should be long enough (12 meters approx.) to cover the whole track/arena and wire should remain slacked during the run across the track.
- Participants must arrange their own batteries.
- Use of IC engines or compressor is not allowed. All vehicles must depend only on electric motors for their motion and control.
- The Robot must not emit smoke or fire, leak, stain or soil.

Dimensions: The following size limitations apply for each robot

- **Width** - Not more than **45 centimeters**
- **Length** - Not more than **45 centimeters**
- **Height** - Not more than **25 centimeters**
- Maximum weight must not exceed 8 kg (including battery for wirelessly controlled Robots). However, a tolerance of 5% is acceptable.

Power Source:

- Only Electrically powered Robots are allowed in the competition.
- Batteries must be sealed, immobilized electrolyte type (gel cell, lithium, NiCad, or dry cells).
- The electric voltage anywhere in the machine should not be more than 12V DC at any point of time.
- Battery can be placed on the robot or can be carried in hand by the robot operator in case of wireless robot.

Construction: 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.

General Roborace & Robo soccer Guidelines

GAME PLAY:

- One run should not last more than five minutes. After the trial time is over, the TIME-UP BUZZER will sound, and the team will be asked to remove the robot from the COMPETITION FIELD.
- Any time used to adjust robot between runs is included in the 5 minutes. The run (from the start to the finish point) in which a robot successfully reaches the destination point will be given as a run time. The minimum run time shall be the robot's official time.

- Each competing Robot will be given points for successfully overcoming the hurdles present on the track. Points allocated to different hurdles will depend upon the difficulty level of the same. Total points achieved for successfully overcoming the hurdles will be added to the final run time of each team in order to calculate the final score. If the team skips any hurdle, it will lose the point for the same.
- Negative points will be awarded for each time the Robot moves out of the track.
- Each run will start from the starting point. The operator may abort a run at any time. If an operator touches the robot during a run, the team will score negative points and shall start from the previous checkpoint. If a robot has already crossed the finish line, it may be removed at any time without affecting the runtime of that run.
- The run timer will start when front edge of the robot crosses the start line and stops when the front edge of the robot crosses the finish line.
- Negative points will be awarded for every human touch which will affect the final score of the team.
- If there is tie, another chance will be given to the teams.
- Soccer play rules will be explained on the spot. (Teams can bring a different robot for soccer event or they can have separate accessories/mountings for the same).

ROBORACE/ROBO SOCCER COMPETITION SCORING:

- The final performance of the team will depend upon two different criteria.
- First preference will be given to robot, reaching fastest to finish-line. 2nd criteria would be scoring maximum points as per following norms.
 - 10 to 20 Points will be awarded based on difficulty of each hurdle. Appx. 10 hurdles will be there at track.
 - (- 5) Points for each human touch. After each human touch, the robot will start from previous "Check point" which is present before each hurdle.
 - (-5) Points for each time Robot goes Off-Track.
 - In Soccer play team with more goals scored will win.

RULES & REGULATIONS:

Team Members & Mentors:

- Minimum 2 members and maximum 03 members are allowed in each participating team. Multiple teams from same school/college can participate in the competition.
- Different Teams from the same school/college must use their own individual Robots for the competition.
- It's not mandatory to have coach for each team but a team can have a coach (only one) from the school or outside as a technical advisor.
- The coach will be seated in a supervisory position around the competition area and is not allowed to touch or repair the robot during the competition.
- The coach should not be involved in the programming of the robot. In case of the coach interference with the robot or referee decisions during the competition, the team will risk being disqualified.
- The robot should follow the robot specifications provided. Any deviation from the mentioned specifications will lead to disqualification.
- No test practice will be allowed on the main track/Arena.
- The Race track/Arena is subject to change before the commencement of any round.
- The decision of the judges will be final and abiding. Argument with judges in any form will lead to the disqualification of the team right-away.

Code of Conduct: Fair Play

- Robots that cause deliberate interference with other robots or damage to the track will be disqualified.
- Teams that cause deliberate interference with robots or damage to the track will be disqualified.
- It is expected that the aim of all teams is to play a fair and clean game.

Behavior:

- Misbehaving teams and participants will be asked to leave the competition area and risk being disqualified from the contest.
- The rules will be enforced at the discretion of the referees, officials, and local law enforcement authorities.

Organizing Committee:

- The Organizing committee is from Faculty of Engineering and Technology.
- All decisions about scoring, game play and timing are made by the juries. Teams should completely respect their vote and decisions.
- **Mr. Asad Habeeb: +91-9643323461**