



AMALTHEA '23



IIT GANDHINAGAR

# ROBOWARS

# AMALTHEA '23

# RULEBOOK

**WEIGHT CATEGORY : 15 kg**





# **PROBLEM STATEMENT**

**Each team has to make a robot that will compete with the robots of other teams. You can make your robot with any material, but it should meet all the requirements of size, weight, power source, damaging equipment, etc., as mentioned in the instructions further. The event consists of two rounds viz. Abstraction Round and the Battle Round, which is an actual fight between the deadly devils created by the teams.**

 **DESIGN SPECIFICATIONS** **DIMENSIONAL SPECIFICATIONS**

- A. The robot should fit in a box of dimensions **75cm x 75cm x 75cm** before the start of each match.
- B. The robot should not exceed the weight limit of **15kg**.
- C. All the pneumatic sources and the battery will be considered for weight calculations. The weight of the controller will not be counted. The machine should not be intentionally split into parts, or any part should not be detached from the robot intentionally.

 **BATTERY AND POWER SUPPLY**

- 1. The robot should be powered by electricity only. The onboard batteries must be sealed, and immobilized electrolyte types such as NiMH, NiCd, Lithium-ion, and dry cells are allowed.

- 2. Use of an Internal Combustion system is prohibited.**
- 3. Each team has to prepare their own power sources. The team has to bring their own battery eliminators.**
- 4. The voltage between any two points within the robot should not exceed 36 volt DC at any point in time.**
- 5. The battery should be well-packed, and there should not be an instantaneous short between battery terminals, causing a battery fire; failure to do so will result in disqualification.**
- 6. The battery should be leakproof and not damaged; otherwise, it will lead to disqualification.**
- 7. The onboard batteries should be well protected. If the judge finds the battery isn't properly protected, the team is immediately disqualified.**
- 8. Change of batteries during the match is not allowed.**



- 9. Only robots with onboard batteries are allowed. It is suggested to carry an extra battery ready and charged up during the matches so that if you advance to the next round, there is no delay in starting your next match.**
- 10. If the team doesn't show up in the allotted time, it will be disqualified.**

## **MOBILITY**

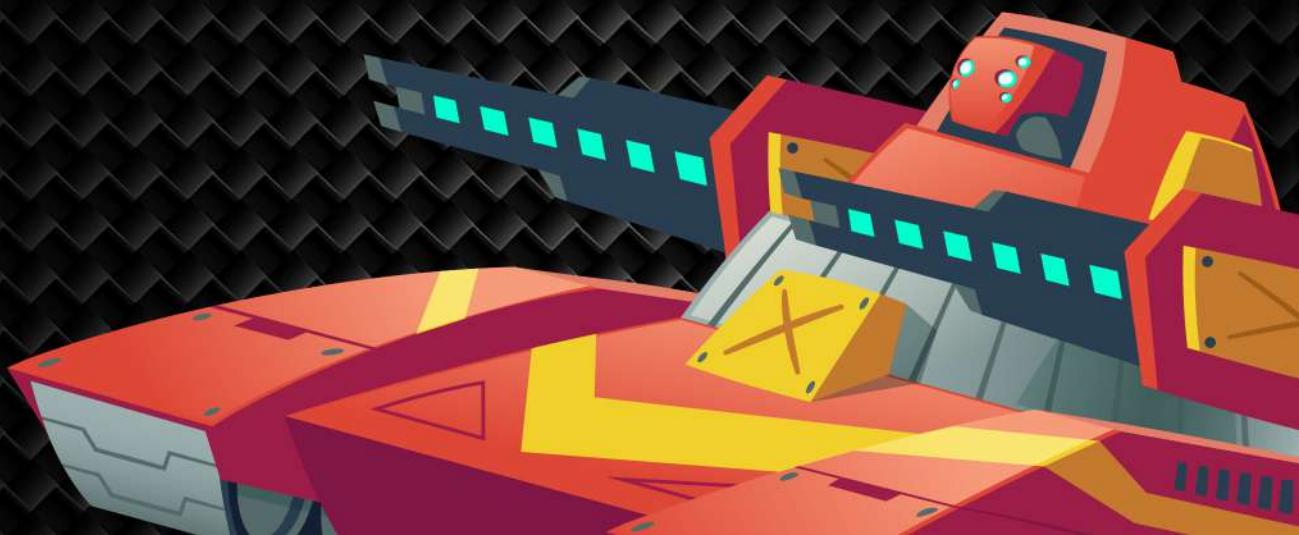
- 1. Robots can have rolling systems(wheels or whole bot), or they can also have non-wheel drive systems.**
- 2. Robots are not allowed to jump or hop.**
- 3. Flying robots are not allowed.**

**If you are using any other controlling system like hydraulic or pneumatic, then you must mention it in detail in the abstract.**



# ROBOT CONTROL REQUIREMENT

1. The robot should be controlled by wireless remote control only.
2. Wired Robots are not allowed.
3. There should be a binding capacity between the transmitter and receiver that they must connect between the polycarbonate sheet, metal bars, and barriers.
4. The team must have four four-channel wireless control circuits or two dual-channel wireless remotes, which can be interchanged before the beginning of the match to avoid frequency interference with other teams. The team's inability to do so will result in disqualification.
5. Any damage caused to the arena can result in loss of points.



 **WEAPONS SYSTEM**

**Robots can have any kind of weapons like cutters, flippers, saws, lifting devices, or hammers, except:**

- 1. Liquid projectiles.**
- 2. Any kind of inflammable liquid.**
- 3. Flame-based weapons.**
- 4. Any kind of explosive or intentionally ignited solid or potentially ignitable solid.**
- 5. Any entanglement device such as nets, tapes, glue, etc.**
- 6. High-power magnets or electromagnets.**
- 7. Radio jamming, Tasers, Tesla coils, or any other high-voltage device.**
- 8. Tethered or untethered projectiles.**

**Any kind of spinning weapon or the robot itself should not cause any damage to the Arena.**





# **ROUND - 1**

## **ABSTRACT SUBMISSION**

**The participants have to submit a PDF document containing:**

- A. Robot Name**
- B. Size of the Robot**
- C. Weight of the Robot**
- D. Components and Weapons used to make the Robot**
- E. Material of the different components and weapons of the Robot**
- F. Battery Specifications + the location of the Battery inside the Robot (because the battery should be placed at a safe, closed place inside the robot preventing any leakage caused due to the damage by other robots).**
- G. All information on how the robot would be controlled**

**You will have to send the model and a video demonstrating the robot's working using the CAD model.**



## **ROUND - 2 BATTLE**

**All teams qualifying in Round 1, will be invited for Round 2. Venue of the Round 2 would be communicated to the qualified teams at a later stage.**

**It will be held over two days, *4th and 5th November 2023*.**

- **On the first day, each team will be randomly allotted a time slot (in the evening) and an opponent. They have to battle against each other and secure their place for Day 2.**
- **The second day is dedicated mainly to the Semifinals and the Finals. Teams qualifying for Day 2 will secure their place for the Semifinals.**
- **Likewise, we will get our 2 Finalists. After the Final Round, we will get our *winner of the first-ever edition of RoboWars at Amalthea*.**

 **CRITERIA FOR VICTORY**

1. A robot is declared the winner if the opponent is immobilized, not pinned by him.
2. The bot is declared immobilized if it is unable to move linearly/rotationally for 15 seconds.
3. If both the robots are mobile after the end of the match, then the winner will be decided subjectively.
4. A robot that is deemed unsafe by the judge after the match has begun will be disqualified and declared the loser.
5. If the robot is thrown out of the arena, the match will be stopped immediately, and the robot inside will be declared the winner.

*The winner will be decided by the Judge according to some criteria like **aggression, control, damage, and strategy**.*

**Each criteria holding a 10 point weightage each with a maximum total of 40 points.**

- A. Aggression:** Aggression is judged by the frequency, severity, boldness, and effectiveness of attacks deliberately initiated by the robot against its opponent.
- B. Control:** Control means a robot can attack an opponent at its weakest point, use its weapons most effectively, and minimize the damage caused by the opponent or its weapons.
- C. Damage:** Through deliberate action, a robot either directly or indirectly reduces the functionality, effectiveness, or defensibility of the opponent. Damage is not considered relevant if the robot inadvertently harms itself.
- D. Strategy:** The robot exhibits a combat plan that exploits the robot's strengths against the weakness of its opponent. Strategy is also defined as a robot exhibiting a deliberate defense plan that guards its weakness against the strength of the opponent. (as per Indian Robowar Rules)

**NOTE:** Qualification of the robot to the next level is subjective and totally on the decision of the judge.

 **SAFETY RULES**

*Failure to follow the rules will result in disqualification.*

- A. Special care should be taken to protect the onboard batteries and pneumatics; a robot without proper protection cannot compete.**
- B. You should pass the safety inspections to be allowed to compete.**
- C. Robots must only be activated inside the arena after proper instructions. Activating your robot outside the arena potentially threatens your and others' safety. If you are found doing so, you will be immediately disqualified.**
- D. All weapons must have a security cover on any sharp edges outside the arena.**
- E. All participants build and operate their robots at their own risk. Combat robots are inherently dangerous. No amount of regulation can encompass all the dangers involved. For any smallest to most minor query, contact us. Any activity causing any damage or threat to anyone can cause a direct disqualification.**
- F. Once the robots have entered the arena, no team member is allowed to enter the arena at any point in time.**

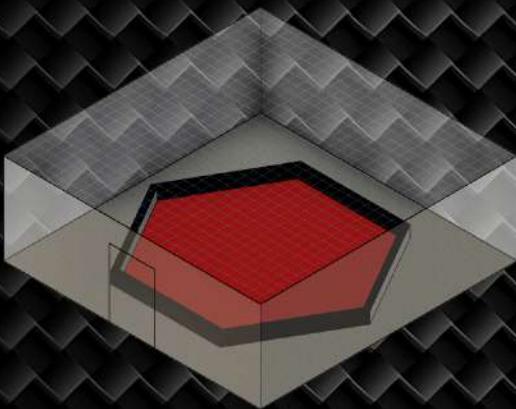
# TEAM SPECIFICATIONS

- A. A team can have a maximum of 5 participants who may be from the same or different colleges.
- B. One participant can't be in two teams simultaneously.
- C. A team should have a unique name which must not be conflicting or inappropriate.
- D. A team can't re-register with a different name or even with a different robot.
- E. Organizers have the right to change a team's name if it is inappropriate.
- F. Each team must specify their team representative(leader) at the time of registration on the website.
- G. The team members should give valid contact details at the time of registration.
- H. It will be disqualified if the team doesn't show up on time.



# ARENA SPECIFICATIONS

- The battle arena (*as shown in red in the schematic CAD model*) will be 0.5 - 1 m inside the polycarbonate walls in order to prevent direct impact.
- The battle arena would be a hexagon platform that can fit inside a 20 x 20 sq. ft. square. The hexagonal battle arena is marked by 2 ft high and 0.25 - 0.3 ft thick wooden walls covered with iron sheets (*as shown in black in the CAD model*). The top of the arena will be protected by an iron mesh.
- The height of the polycarbonate walls is 8ft, and the polycarbonate sheets will make a square side length of about 20 - 24 ft.
- The arena will remain closed all the time and open only during the entry and exit of the robot.
- The CAD Model of the Arena:



*\*These specifications are subject to change. All the updated information will be conveyed to all the teams as soon as possible. All the rules and specifications have been derived from the Indian Robowar Rules and Specifications by RoboticsIndia.*



# **PRIZES AND CERTIFICATION POLICY**

- Certification of Excellence will be given to the finalists.
- All participants will be given a Certification of Participation.
- The teams will get disqualified for disobeying any of the competition rules, and they will not be considered for certification.

***Total Cash Prizes worth:***

***INR 2,00,000.***

***Including....***

**FIRST PRIZE**

***INR 75,000***

**SECOND PRIZE**

***INR 50,000***

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## CONTACT US

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