

ROBO WARS

GENERAL RULES

- Contestants will have to register online. On spot registrations can also be done.
- The students must carry valid **student ID** cards of their college which they will be required to produce at the time of registration.
- A team may comprise a maximum of **FIVE** participants.
- A team can comprise of students from different colleges.
- The team is not permitted to compete with more than one robot.
- The event organizers reserve the right to stop the match at any point of time if they deem that the match is turning out to be dangerous or if there arises a need for either of the teams to untangle their wires.
- The contestants are requested to comply with the organizers in this regard, violation of which will lead to an immediate disqualification.

EVENT FORMAT

- The competition will be played on **knock-out** basis.
- The machine would be checked for its safety during registrations. In case of unsafe robots, the teams will be allowed to modify the robot before the registrations close.
- Only one person can control the robot and one person can stay near the arena for monitoring the robot.
- Each team will have a maximum time period of 10 minutes to repair their robot after each battle round.
- The teams should make sure their wires are slack and all the wires coming out of robot need to be held together with insulator material.
- The wires coming out of the robot should be placed in such a way that it should be safe from any attacks on the bot and the attack mechanisms provided by the organizers. The organizers will not be held responsible in case of any damage to the bot because of the attack mechanism provided.
- *The organizers reserve the right to change any or all of the above rules or add any rules as they deem fit.*
- Violation of any the above rules will lead to disqualification.
- Judges' decision shall be treated as final and binding on all.

EVENT RULES

- The maximum duration of each battle would be **10 minutes** except for the finals which will be a **15 minute** battle. Each battle would consist of three rounds of 3 minutes each (5 minutes for the finals).
- Any time allotted to you will be strictly enforced and no extra time will be allotted.

- A robot that is deemed unsafe by the judges after the match has begun will be disqualified. The match will be immediately halted and the opponent will be awarded a win.
- The robots are not allowed to cut the opponent's control wires. Violation of this rule will lead to disqualification.
- In case of immobility of any of the bots, both the bots will start again from their start point.
- Any team that is not ready at the time specified will be disqualified from the competition and the opponent robot will be declared the winner.

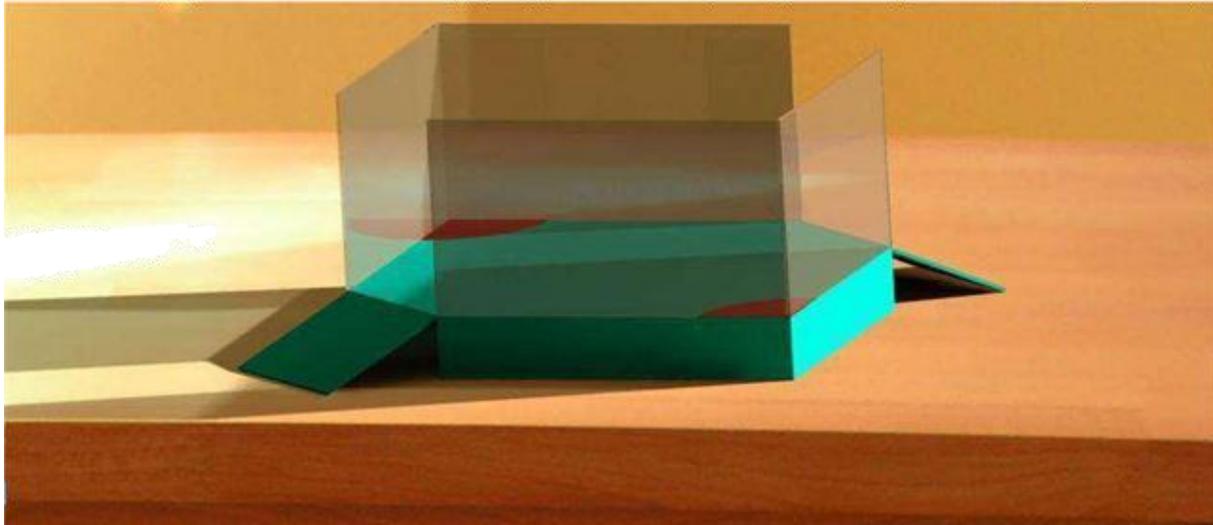
JUDGING CRITERIA & SCORING

- Points will be awarded by the judges to a robot only if it has a considerable impact/damage on the opponent's robot. (Definition of damage will be decided by the judge and will be binding to all. **NO discussion will be entertained**)
- Points can be won by immobilizing (**pinning**) the opponent robot for a period of **10 seconds**.
- Only two pins per bot are allowed per round.
- Points will be awarded for the team for using the offensive mechanisms provided by the organizers.
- **Winning the match: The robot winning the maximum of the three rounds will be declared the winner.**

ARENA SPECIFICATIONS

- The arena will be a square wooden board of side 8 ft.
- The arena may have one or more of the following traps:
 - Reciprocating Platform with about 1 – 20 reciprocations per minute.
 - Rotating Platform of about 30 – 300 rpm.
 - Lifting Mechanisms.
 - Sand/Gravel/ Slush Pits of dimensions 70 cm x 70 cm. Depth of the pits from the arena surface are at an average of 3cm.
 - Corrugations with a maximum radius of 10cm and pitch 20 cm.
 - Rollers with a maximum diameter of 6 cm.
 - Hitting Mechanisms.
 - Heavy Oscillating Metal Balls

Note : Any damage to the arena will result in deduction of points and if the same bot causes even more damage after that (irrespective of different matches) will lead to **immediate disqualification.**



MOBILITY

- All robots must have easily visible and controlled mobility in order to compete.
- Any machine component should not be detached (intentionally) during any point of the war.
Eg: arrows/bullets cannot be shot at the opponent.
- The maximum power limitation for mobility is **200 W**. Robots which fail to comply with this rule will lose points during the battle according to the criterion decided by the judges.
- However there is no power limitation for attack mechanism.
- Methods of Mobility include:
 - Rolling (wheels, tracks or the whole robot)
 - Walking (linear actuated legs with no rolling or cam operated motion).
 - Shuffling (rotational cam operated legs)
 - Jumping and hopping is not allowed
 - Flying (airfoil using, helium balloons, ornithopters, hovercrafts etc.) is not allowed.

BOT SPECIFICATIONS

- Initial dimension of the robot should not exceed **75cm x 75cm x 75cm (l x b x h)**. The external device used to control the machine or any external tank is not included in the size constraint.
- Weight of the robot should not exceed **40 kg (10% tolerance is allowed)** (Excluding remote control and control wires).
- If the robot uses external pneumatic / hydraulic source tank, its weight would not be considered.
- If the robot is solely powered by onboard batteries (wireless robots), its weight would be considered **0.8 times its actual weight**.
- The bot should contain an attack mechanism. Attack mechanism should be independent of the motion of the bot i.e. **it should work even if the bot is**

motionless. A separate check of the attack mechanism will be conducted when the bot is immobile.

- The robot should have a small ground clearance such that the arena is not damaged at any point of time. ***The bot which causes any damage to arena will be disqualified.***
- A robot check may be performed at any time during the event based on the discretion of the judges.

PNEUMATIC /HYDRAULIC SYSTEMS

- Participants can use pneumatic and hydraulic weapon systems.
- The outlet pressure of the source/tank ***should not exceed 8 bars***. The used pressure should be indicated by means of temporarily fitted pressure gauge or there should be a provision to measure the cylinder pressure on the bot.
- Robots can use pressurized, non-inflammable gases/liquid to initialize their pneumatic mechanisms.
- Teams have to bring their own cylinders. Organizers will not provide any kind of refilling.
- Weights of the external cylinders are not taken into account.

BATTERY AND POWER SUPPLY

- Both on and off board power supplies are allowed. Batteries must be sealed, immobilized electrolyte types (such as gel cells, lithium, NiCad, NiMH, or dry cells).
- The voltage between any two terminals in the robot should ***not exceed 25V***. There is no restriction on the power consumption of the bot.
- 230V AC power will be provided.
- Participants can make use of one or more DC/Stepper motors.
- Use of an IC engine in any form is not allowed.
- If the robot is wired then the wire should remain slack under all circumstances during the competition. The length of the wire between controlling device & the power supply and between machine & controlling device should be at least 4 meters.

WEAPON SYSTEMS

- ***The bots must have at least one kind of attack mechanism.*** Defensive bots like Wedge bots will be disqualified.
- Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. as weapons with following exceptions and limitations:
 - Liquid projectiles.
 - Any kind of inflammable liquid.
 - Flame-based weapons.
 - Electro-Magnetic Pulse.

- Any kind of explosive or intentionally ignited solid or potentially ignitable solid.
- Nets, tape, glue, or any other entanglement device or adhesives.
- High power magnets or electromagnets.
- Radio jamming, lasers, tesla coils, or any other high-voltage device.
- Un-tethered projectiles.
- Tethered projectiles in any direction with each having a maximum tether length of 1m are allowed.

- Spinning weapons which do not come in contact with the arena at no point of time are allowed. In no case should the arena be damaged by any bot. Violation of this rule will lead to immediate disqualification.

SAFETY RULES

- Compliance with all event rules is mandatory. It is expected that competitors stay within the rules and procedures of their own accord and do not require constant policing.
- If you have a robot or weapon design that does not fit within the categories set forth in the above said rules or is in some way ambiguous or borderline, please contact the event organizers.
- Safe innovation is always encouraged, but surprising the event staff with your brilliant *exploitation of a loophole may cause your robot to be disqualified before it even competes.*
- Each event has safety inspections. It is at the judge's sole discretion that your robot is allowed to compete. As a builder you are obligated to disclose all operating principles and potential dangers to the inspection staff.

- Proper activation and deactivation of robots is critical. Robots must only be activated in the arena, testing areas, or with express consent of the event coordinators.
- All weapons must have a safety cover on any sharp edges.
- All participants build and operate robots at their own risk. Combat robotics is inherently dangerous. There is no amount of regulation that can encompass all the dangers involved.
- Please take care to not hurt yourself or others when building, testing and competing.

CONTACTS

Darshan S
+91 8861832038

Akarsh MS
+91 8762167250
mechanicalcommittee.nitk@gmail.com

