



ROBO WAR

TASK

Design and construct a remote-controlled robot capable of fighting a tournament against another robot(s).

DESIGN SPECIFICATIONS

Specifications:

- There will be no restrictions on the dimensions of the bot(s).
- The weight of the machine should not exceed 4 Kgs, which includes the weight of all components onboard.
- The weight of the remote controller will not be counted.
- A bot can be in a "Cluster Bot" formation. Each bot must meet the requirements described in this problem statement. The total weight of all the bots and the dimensions of the combination of bots must satisfy the above two points.
- Objects in question to human damage should not be used on the robot.

Mobility:

- All robots must have easily visible and controlled mobility in order to compete.
- Methods of mobility include:
 - Rolling (wheels, tracks or the whole robot).
 - Non-wheeled: non-wheeled robots have no rolling elements in contact with the floor and no continuous rolling or cam operated motion in contact with the floor, either directly or via a linkage, but are not true walkers as defined below.
- Manually operated jumping and hopping are allowed. However, the maximum height of any part of the machine should not exceed 4ft during any stage of competition
- Any damage caused due to the jumping mechanism is solely the responsibility of the team.
- The robots should not secure themselves on the surface by any means.

Robot Control Requirements:

- The robot must be controlled only through a wireless remote, while all power supply must be on board.
- Autonomous functions within the bot are acceptable, the controller must be able to remotely disable or override these functions at any time.
- Cases of any interference in the wireless systems will not be considered for rematch or results.





- Remote control systems from toys may be used. Remote control systems available in the market may also be used
- Nonstandard or self-made remote-control systems can be used only after approval from the organizers.
- The team should pair up the wireless remote with the machine before putting it into the arena.

Battery and Power:

- The machine must be powered electrically.
- Participants will have to bring their own converters for standard power supply according to Indian standards.
- Participants must protect the battery terminals from a direct short and causing a battery fire, failure to do so will cause direct disqualification.
- Special care should be taken to protect the onboard batteries.
- Only bots with onboard batteries will be allowed.

The supply from the battery to all the weapons and power systems should qualify the following fail-safes:

- A manual disconnect (switch) that can be turned off without harming the person doing it, i.e. No body parts or weapons should come in the way of the switch.
- Manual emergency stop that can be triggered through the radio controller
- The teams are suggested to have at least one extra battery ready and charged up during competition so that on advancing to the next level, they won't have to wait or suffer due to the uncharged battery.
- If teams do not show up during their allotted slot, they will be disqualified.

Weapon Systems:

Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc.

- **Following weapons cannot be used:**
 - Liquid projectiles
 - Any kinds of inflammable liquids (max 450ml)
 - Weapons causing invisible damage
 - Weapons causing opponents' weapons (spinners) to entangle in them (Chains, Ropes or loose Fabrics).

All weapons must come to a full stop within 60 seconds of the power being removed using a self-contained braking system.





COMPETITION RULES AND SPECIFICATIONS

Team Specifications:

- Any team can participate in the Robowars, Prodyogeeky.
- A team may consist of a minimum of 2 and a maximum of 4 participants. These participants can be from the same or different institutes.
- Team Captain: Each team must specify their team captain at the time of registration on the website. All the important communications between Techfest Organizers and the registered teams will be done through their team captain.
- The team must submit valid contact details at the time of registration.

Registration:

- Start preparing your bots for the competition. A mail will be sent when the registration portal goes live.
- Prodyogeeky organizers will make sure that the registrants are informed about any updates through email/SMS.

Match Duration and Type:

- Matches will consist of 3 minutes of active fight time exclusive of any time-outs. Hence, it is not binding but advisable to keep battery capacity, power usage and machine defenses such that they can sustain a 3- minute fight.

The matches can be of the following types:

- A regular 1-on-1 combat between 2 robots
- Resurrection Match: A combat involving robots, each of which has previously lost at least one match.
- A combat between more than 2 robots simultaneously
- A detailed document of rules regarding the format and rules to be followed during the event days shall be uploaded later, and the participants will be informed.

Match Frequency:

- A team is allowed to prepare for the next match for a period of 20 minutes. This time is calculated from the time the robot leaves the post-match staging area of its previous match.
- In extreme cases, the 20-minute time period may be lengthened at the discretion of the event organizers.

Criteria for victory:

- A robot is declared victorious if its opponent is immobilized.





- A robot will be declared immobile if it cannot display the linear motion of at least one inch in a time period of 10 seconds. A bot with one side of its drivetrain disabled will not be counted out if it can demonstrate some degree of controlled movement. In case both the robots remain mobile after the end of the round, the winner will be decided subjectively.
- A robot that is deemed unsafe by the judges after the match has begun will be disqualified and therefore declared the loser. The match will be immediately halted and the opponent will be awarded a win.
- If a robot is thrown out of the arena the match will be stopped immediately, and the robot inside the arena will automatically be declared as the winner.
- Robots cannot win by pinning or lifting their opponents. Organizers will allow pinning or lifting for a maximum of 20 seconds per pin/lift then the attacker and the robot will be instructed to release the opponent.
- If two or more robots become entangled or a crushing or gripping weapon is employed and becomes trapped within another robot, then the competitors should make the timekeeper aware, the fight should be stopped and the robots separated by the safest means.
- If a bot gets stuck inside the arena due to the deformity of the arena itself the timer will be stopped and the bot will be released by the safest means.

Points will be given on the basis of aggression, damage and control.

- Aggression: Aggression is judged by the frequency, severity, boldness and effectiveness of attacks deliberately initiated by the robot against its opponent. If a robot appears to have accidentally attacked an opponent, that act will not be considered when judging for aggression.
- Control: Control is judged in terms of the ability to attack an opponent at its weakest point, using weapons in the most effective way, and minimizing the damage caused by the opponent.
- Damage: Through deliberate action, a robot either directly or indirectly reduces the functionality, effectiveness or defensibility of an opponent. Damage is not considered relevant if a robot inadvertently harms itself. Also, if a pressure vessel or a rapidly spinning device on a robot fragments, any damage to the opponent will not be considered "deliberate".

Event Specific Terminology:

- Disabled: A robot is not functioning correctly due to either an internal malfunction or contact with the opposing robot or Arena Hazard.
- Disqualification: A robot is no longer permitted to compete in the current Robowars tournament. Immobilized: In the judges' opinion, a robot is not





responsive for a specified period of time. Knockout: Occurs when the attack or deliberate actions of one robot causes its opponent to become immobilized.

- Lifting: Occurs when one robot controls an opponent's translational motion by lifting the drive mechanism of the opponent off of the Arena floor.
- No Contact: Neither robot makes contact with the other for a specified period of time.
- Pinning: Occurs when one robot holds an opponent stationary in order to immobilize it.
- Radio Interference: Refers to a situation where at least one robot becomes unresponsive or non-controllable due to the effect of the other robot's remote-control signal.
- Non-Responsive: In the judges' opinion, the robot cannot display some kind of controlled translational movement along the arena floor.
- Restart: Occurs after a fault or a timeout has been declared and the competing robots are ready to continue.
- Stuck: A robot is hung-up in a part of the arena, an arena hazard or an opponent, such that it is effectively non-responsive.
- Tap-Out: Occurs when a robot's operators decide that they no longer want to continue the match and concede the win to the opposing team.
- Technical Knockout: Occurs when a robot wins due to immobilization of its opponent even though, in the judges' opinion, no action of the winning robot caused the opponent's immobilization.
- Timeout: A temporary halting of a match. Timeouts are usually called to separate robots but can be called for other reasons as well.

Certificate Policy:

- Certificate of Excellence will be given to all the winners.
- Certificates of Participation will be given to all the teams who qualify in the first round of the competition.
- The teams which get disqualified due to disobeying any of the competition rules will not be considered for the certificate.
- A cash prize of INR 50 Thousand will be given for winning, best design, and other subjective criteria which the organizers seem fit.

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.
- Special care should be taken to protect the onboard batteries and pneumatics, robots without proper protection will not be allowed to compete.





- If you have a robot or weapon design that does not fit in this ruleset or is somehow ambiguous, please contact the organizer at the earliest.
- 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.
- All the resources provided at the time of competition from the organizers should be strictly used only after the consent of the organizers.
- Once the robots have entered into the arena, no team member can enter into the arena at any point of time. In case if a fight has to be halted in between and some changes have to be done in the arena or condition on the robot(s), it will be done by organizers only.

ARENA SPECIFICATIONS

- The arena details will be conveyed before the start of the event.
- Proper protection and safety measures would be taken to prevent any kind of accidents.

PRIZES

- The prize money will be awarded to winners via NEFT and will be processed within 25 working days after receiving the prize money from our sponsors.
- The winners will have to mail the following information (immediately after the announcement of results) to **techclub@nituk.ac.in** strictly in the following format:
 - Subject
 - Competition Name, Team ID - your position (example- Robowars, PG1003- 3rd Position)
 - Body of mail:
 - Captain Account Holder's Name
 - Account Number
 - Bank name and Branch name.
 - IFSC Code





AN IMPORTANT NOTE:

- A robot winning in a round against its opponent doesn't guarantee its entrance into the next round. If the judges found the winning robot incompetent to enter into the next round, it may get disqualified.
- Judges can disqualify both the robots of a match from advancing to the next round. All the decisions taken by the judge will be final and binding to all. Any queries afterwards will not be entertained.
- These rules may change at any time, even without explicit notification to teams.
- However, the document uploaded here is to be followed as the latest problem statement for all the rules and design specifications. The teams acknowledge that they have a responsibility to read, understand and abide by the rules and
- Prodyogeeky reserves the right to prevent any team from competing at any time for any reason.
- In case of any queries, participants are encouraged to contact Prodyogeeky'24 Team.
- Prodyogeeky'24 has the rights over the guidelines and can alter them as per the requirements.

