



## Robocombat

Beat, Defeat, Win, Repeat

### Introduction

Robo-combat is a major combat robotics event which focuses on designing and manufacturing of robots made to annihilate its opponents and keeping itself as safe as possible. Winner is decided on the basis of destruction it has caused to its opponents. It will have two categories: 15 kg and 60 kg.

### Prize Money

For 15 kg Category:

1<sup>st</sup> prize: 25,000

2<sup>nd</sup> Prize: 15,000

3<sup>rd</sup> Prize: 10,000

For 60 kg category:

1<sup>st</sup> prize: 50,000

2<sup>nd</sup> Prize: 30,000

3<sup>rd</sup> Prize: 20,000

### Problem Statement

Round 1

Teams will need to submit a proof of concept (POC) of the model.

Round 2

It will be an on-site one-to-one fight. The two robots will be fighting in the arena. The track of points will be maintained for both the teams and the team having maximum points will be declared as winner for that round. This round can be further divided in sub rounds e.g. semifinals and final.

### Track Specification

- Arena is rectangular in shape with dimension 18 x 16 x 10 foot.
- Height of the side safety wall, which is made of M. S, has a height of 0.5m.
- Height above the safety plate is of polycarbonate plate with cage. Top of the arena is covered with cage.

### Judging Criteria

- A bot is declared victorious if its opponent is immobilized.
- A bot is declared immobilized if it cannot move linearly/rotationally for more than 30 seconds.



- A robot with one side of its drive train disabled will not be counted immobilized, if it can demonstrate some degree of controlled movement.
- In case both the robots remain mobile after the end of the round then the winner will be decided subjectively.
- Points will be given on the basis of aggression, damage, control, and strategy.
- Pinning occurs when one robot, through sheer force, holds an opponent stationary in order to immobilize it.
- Organizers will allow pinning or lifting for a maximum of 15 seconds per pin/lift then the attacker robot will be instructed to release the opponent.
- If a team fails to stop the pinning/lifting for several times, that team can also be disqualified.

## Machine Specification

- The bot should not exceed 60kg weight including the pneumatic/hydraulic (the components of bot which will be out of arena do not count in this 60kg).
- Robots can be wired or wireless.
- Source, batteries (including external) and any other component excluding remote. The robot should fit in the box of 750mm x 750mm x 1000mm.
- All times, the external device used to control the robot or any external tank is not included in the size constraint.
- If the bot is wired, length of the wire should be more than 5m (according to arena dimension) but less than 10m. The wire should remain slack under all circumstances during the competition.
- All the wires coming out of the machine should be stacked as a single unit. The wires should be properly insulated.
- Bots can have zero ground clearance provided they do not damage the arena.

## Mobility

- Rolling (wheels or whole bot).
- Linear actuated legs or cam operated motion or any non-wheeled drive system.
- Jumping or flying with the help of propellers or gas balloons is not allowed.

## Electrical System Specifications

- Bot can be powered electrically (DC) by batteries with electrolytes such as Li-ion, Li-Po, NiCad, gel cells, lead-acid, etc.
- The electric voltage between 2 points anywhere in the machine should not be more than 24 V DC at any point of time.
- Batteries should be charged up before advancing to the match.
- All efforts must be made to protect battery terminals from a direct short and causing a battery fire, failure to do so will cause direct disqualification.
- Internal combustion engines as a source of power will not be allowed.
- Any kind of inflammable liquid will not be allowed to use in the bot by any means.



## Pneumatics and Hydraulics

- Robot can use non-inflammable liquid to actuate hydraulic devices.
- Maximum pressure in the storage/source tank must not exceed 8 bars.
- There should be provision to check the storage tank or source tank pressure with an integrated or temporarily fitted pressure gauge.
- All hydraulic liquids should be non-corrosive and leak proof.
- Special care must be taken while mounting pump, accumulator, and armor to ensure that if ruptured direct fluid streams will not escape the robot.

## Attacking/Weapon System

- Robots can have any kind of cutters, flippers, saws, lifting devices, spinning hammers, Spinning drums, etc. as weapons.
- Following weapons or attacking systems are not permitted:
- Liquid projectiles and tethered or untethered projectiles.
- Any kind of inflammable liquid.
- Any kind of explosive or intentionally ignited solid or potentially ignitable solid.
- Nets, tape, glue, chains or any other entanglement device.
- High power magnets or electromagnets.
- Radio jamming, lasers, tesla coils, or any other high-voltage device.
- Spinning weapons that do not come in contact with the arena at any point of time are allowed.
- In any case, the arena should not be damaged by any bot.

## Game Rules

- Robots will be tested for dimensions & safety before each match.
- Both the bots before starting the match should be in their respective starting zones.
- Each match will be of 2 rounds of duration 5 minutes and the winner will be decided on the basis of winning criteria.
- No mechanism of the bot should start before and after the match inside arena.
- The winners of the qualifier matches will be declared as per the points they would achieve in the rounds.
- In the case of a tie, a rematch of 5 minutes will decide the winner.
- A team can get a timeout of 2 minutes per round to repair minor casualties.
- Points will start to get deducted as the timeout exceeds 2 minutes.
- In case of a situation aroused during the match if both the teams agree, time will be paused and the bots will return to the starting zone.
- In case if there is any managerial/technical problem, organizers can delay the match.

## General Rules

- Any damage caused to the arena at any point of time will lead to disqualification /penalty.
- A team member can't be a part of more than one team.



- Bring your college/student I-Card at the time of competition.
- Any of the above-mentioned rules, if found violated, teams would not be allowed to participate in the competition.
- Decision Taken by Judges will be final and binding for all.
- Any misbehaviour will lead you to disqualification from the competition.
- In case of any disputes, the decision of the organizer's and the jury's decision will be final.

## Team Specifications

- Members of a team may be from the same college/school or different (K12/UG/PG).
- Any number of teams can participate from one college/school.
- Participants can build a single robot or cluster of robots (according to given rules).
- A team can have a maximum of 6 participants may be of same or different colleges. But one participant cannot participate simultaneously in 2 or more teams.
- Once registered, the same team cannot register with another name or for another robot other than previously registered one.
- Every team must have a unique name that should not be offensive conflicting or inappropriate.
- Organizers have the right to reject entries for any inappropriate team name.
- Organizers must be notified if a team's name has been changed.
- Team Representative: Each team must specify their Team Representative (Leader) at the time of registration on the website. All important communications between the organizer and the registered teams will be done through their Team Representative. The Team representatives must submit valid contact details (phone no., email id, etc.) at the time of registration.
- If teams don't show up on allotted slot, they will be disqualified.

## Safety Rules

- Robots must be activated in the arena or with the expressed consent of the event coordinators.
- All participants build and operate robots at their own risk.
- Please take care you do not hurt yourself or others when building, testing and competing.
- Organizers will not be responsible for any injuries to the operator or team members.
- Violation of any of the above rules will lead to disqualification of the respective team.
- 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.
- Robots intentionally damaging the wires of the opponent will be disqualified.
- Also, each team should keep their wires above the ground.
- Robots intentionally and/or extensively damaging the arena will be disqualified.
- If the wires of the robot are cut because of its own strategy and if fail to repair within match time then the team will be disqualified.
- Special care should be taken to protect the on-board batteries and pneumatics, robot without proper protection will not be allowed to compete.



## Event Timeline

Round 1 (Virtual Mode)	Deadline	3 <sup>rd</sup> April 2022
	Result Declaration	6 <sup>th</sup> April 2022
Round 2	On-site Event	17 <sup>th</sup> April 2022

## Registration Details

Registration window will open soon!