

# Robo Wars

Robo Wars, is synonymous with carnage, demolition, mayhem, destruction; not to mention the hyped atmosphere. The teams are required to design and fabricate a reliable robot which has brutal yet effective offense; well armored defense and uncompromising nimbleness. All in the pursuit of bragging rights and the title of the best fighting bot in the competition.

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REGISTRATION PROCESS: <https://www.mahetechnovanza.com/subpage/robowar.html>

1. Last date of registration is 15<sup>th</sup> November 2019.
2. Name of the Team Members & Robot/ Team Name.
3. The event will take place on the 20<sup>th</sup> & 21<sup>st</sup> of November.

## RULES

- The Contest judges may **stop any robot at any time** if they feel that it is performing, or is about to perform, any action that is dangerous or hazardous to people or equipment.
- All (Major) Electronic Circuitry must be designed and fabricated by the Contestants themselves.
- Maximum effort in the design of the structure of the robot should be generated by contestants themselves.
- In all matters of interpreting the rules before and during the Contest and in any issues may not covered by these rules (unintentionally), the decisions of the Contest Judging Committee will be final.

## ROBOT OPERATION

- The qualifying teams will compete with each other in a knockout format.
- In each match two teams will compete against each other, fighting their robots' side by side in the contest arena.
- Teams will be declared as a red team or blue team based on the coin toss before every match. Robots will be maneuvered by wireless Remote- control of any sort, without any intervention of human body.
- Contestants are **NOT** allowed to touch their robots or enter the Contest Arena after startup.
- After the blow of whistle, the robot would have 5 minutes to compete with another robot.
- The robot must be placed on the defined point in the arena before fighting.

## FIGHTING RULES

- For a particular match, both teams would face the same conditions.
- Any team that damages the arena will be **disqualified**.
- The Robot **CANNOT** split into 2 separate robots after start of the fight, only one Robot is allowed to compete with opponent.
- During its operation robot is **NOT** allowed to extend any extension/support for any purpose, the area of the robot should remain the same throughout the operation i.e. it should fit in **50cm X 50cm X 50cm** cube.
- The robot is **NOT** allowed to climb over the walls of the arena.
- The fight will be over when a robot puts the opponents' robot out of action (ie. Robot becomes immobile or irresponsive).

## DIMENSIONS AND FABRICATIONS

- The robot must fit within **50cm X 50cm X 50cm** cube at all times of its operation, and teams are not allowed to make any extensions to it once finalized by officials.
- All weapons on the robot will be counted as part of the robot's total dimensions.
- If contestants want to add a flag, hat or other purely decorative, non- functional items to the robot, they may do so. The decorations may be removed for measurement purposes.
- The weight of robot excluding decorations must not exceed 32 kg.

**Penalties as detailed in section below will be levied if the robot does not fulfill the size and/or weight criteria.**

## MOBILITY

- All robots must have easily visible and controlled mobility in order to compete.
- Methods of mobility include:
  - a) Walking (linear actuated legs with no rolling or cam operated motion).
  - b) Rolling (wheels, tracks or the whole robot)
  - c) Shuffling (rotational cam operated legs)
  - d) Flying (airfoil using, helium balloons, ornithopters, etc.) is **NOT** allowed.
  - e) Jumping and hopping is **NOT** allowed.
- Proper activation and deactivation of robots is **critical**.
- Robots must **only** be activated in the arena, testing areas, or with expressed consent of the safety officials.
- All robots must be able to be **FULLY** deactivated, which includes power to drive and weaponry, in less than 20 seconds by a manual disconnect.
- All robots not in an arena or official testing area must be raised or blocked up in a manner such that their wheels or legs cannot cause movement if the robot is turned on.

## ROBOT CONTROL REQUIREMENTS

- All teams **must have** at least 2 remote controllers of different frequencies or 1 controller that has a variable frequency controller (to prevent the frequency interference between 2 robots).
- Having at least two frequencies or coded channels available is recommended.
- All robot navigators will be required to inform that match officials of the frequency that you are using prior to the start of the round so that any overlap of frequencies can be avoided.

## WEAPON SYSTEMS

- All pyrotechnics are **BANNED**. These include:
  - a) Explosives
  - b) Flames
  - c) Firearms
  - d) Corrosives
  - e) Liquids
  - f) electronic devices (e.g. Radio jamming, Heat-guns, Tesla coils)
- Devices using inflammable or combustion-supporting gases are banned.
- None of the teams are allowed to use weapons that intentionally or unintentionally may cause damage to the arena.
- All sharp edges of weapons, including fixed weapons (e.g. spikes) and robot bodywork, **MUST** be fitted with adequate protection that must be in place at all times except in the arena. (These guards are not included with the overall weight of the robot).
- Any moving or swinging arms (whether or not they hold **sharp** and/or **rotating** weapons) **MUST** be fitted with a visible locking pin that shows the arm(s) is securely locked into place.

## ELECTRONICS

- All electronic circuitry must be designed and fabricated completely by the participants themselves.
- Microcontrollers specified in the component list must be used for controlling your robots.
- Microprocessors and Single Board Computers are **not** allowed.
- Motor drive circuits should be designed and fabricated by participants themselves and made from discrete components like Transistors and logic circuitry.

## POWER SUPPLY

- All robot must be battery-powered.
- **Allowed batteries:**
  - a. NiCd (Nickel-Cadmium)
  - b. NiMH (Nickel-metal Hydride)
  - c. LiPo (Lithium Polymer)
  - d. Sealed Lead Batteries
  - e. LiFePo4 (Lithium Iron Phosphate)
- Power sources that are considered dangerous or unsuitable by the contest officials shall not be permitted.
- The batteries must be **adequately protected to prevent leakages and explosions.**
- Changing battery during the match is **NOT** allowed.

## TEAMS

- Maximum number of members in a team are **4** and minimum are **2**.
- You **MUST** have a designated robot navigator.
- You are allowed to have 2 people manning the navigation and weapon systems separately.
- The members who are operating the bot must wear safety equipment such as **safety goggles, safety gloves and safety boots.**

## DURATION OF MATCH

- Each match will be of maximum 5 minutes duration.
- Teams will be given 1 minute for setting up the Robot at the start.
- Robot can start at the instant when the start signal is given and a whistle is blown. Robot must be constructed so that it can be started in minimum possible steps.
- Once the Robot starts, team members will **not** be allowed to touch the robot **or** enter the contest arena.
- Timing shall start once the start signal is given and the whistle is blown.

- If none of the team is able to disarm, immobilize or crush the opponent in the allocated 5 minutes, the team having more points at that time would win the match.
- If both the teams have scored same points in allocated time slot, decision of the winner will be decided by the judges.
- Under no circumstance will any timeouts be allowed.

#### POINTS AWARDING CRITERIA

Point scoring is shown in the table below:

1.	Turning opponent's robot upside down.	10 Points
2.	Taking off any part of opponent's robot.	15 Points
3.	Pushing robot where platform weapons (if any) cause damage	10 Points
4.	Hitting the opponent's robot with weapons	2 Points

Winning would be dependent on maximum damage to the opponent.

#### POINTS DEDUCTION CRITERIA

The deduction of points is described in the table below:

1.	Oversize Robot.	<b>Disqualification</b>
2.	Overweight Robot (Weight between <b>30</b> and <b>32 kg</b> )	-5 Points
3.	Overweight Robot (Weight exceeding <b>32 kg</b> )	Devaluation of 5 points per 0.5 kg
4.	Damaging the arena/wall/platform weapons.	<b>Disqualification</b>

#### DISQUALIFICATION

The following behavior shall be considered for disqualification by the referee and the team could possibly be disqualified:

- Attempting to damage the game field.
- Performing any act that fails to comply with the spirit of Fair Play.
- If the contestants enter the arena during the match, it would automatically be counted as a disqualification.