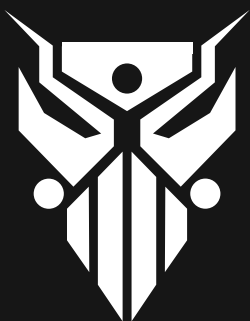


ROBOWARS 2025

Powered by **SIEMENS**

RULES & REGULATIONS





TASK

Task is to build a wireless combat robot capable of fighting against other combat robots in a safe and controlled manner.

DESIGN SPECIFICATIONS

Dimensions and Fabrications

Weight Classification

Middleweight	60 kg
Featherweight	15 kg
Dogeweight	8 kg

The machine should not exceed the above specifications. All the batteries should be on-board, only the weight of the remote controller will not be included.

Participating teams must adhere to a strict 0% weight tolerance, ensuring that the bot's total weight remains within the specified limits at all times and kill switch is compulsory.

The weight of the bot will be checked before and/or after every match.

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 must not cross the limits in the above point. Participating teams having multiple bots can compete in their combined weight category, i.e., for example two 30kg bots of the same team can compete in the 60kg weight category.



MOBILITY

All robots must have easily visible and controlled mobility in order to compete. Methods of mobility include:

1. Rolling (wheels, tracks or the whole robot).
2. Non-wheeled: Non-wheeled robots have no rolling elements in contact with the floor and have no continuous rolling or Cam Operated motion in contact with the floor, either directly or via a linkage, but are not true walkers. Motion is continuous if continuous operation of the drive motor(s) produces continuous motion of the robot. Linear-actuated legs and novel non wheeled drive systems are allowed under this category.
3. Jumping and hopping is allowed (manually operated). However, the maximum height of any part of the machine should not exceed 6ft during any stage of its jumping/hopping and any damage caused due to its mechanism as well as the arena is responsible to the team.

Mobility methods that are **NOT** allowed:

1. Flying(using airfoil, helium balloons, etc) are not allowed.
2. Robots should not secure themselves on the ring by using suction cups, etc.



ROBOT CONTROL REQUIREMENTS

1. All robots must be controlled through wireless remote only, and all power supply must be on-board only. No external connections (wired) will be allowed during matches.
2. Control must be exhibited over all of its functions and positions at all times and should be displayed even during matches at the say-so of the judges/organizing team.
3. Although Autonomous functions within the bot are acceptable, but the controller must be able to remotely disable or override those functions at any time. Also note that any damage due to this function is a responsibility of the team, and there must compulsorily be a manual emergency stop (E-stop) function that should be controlled from the radio controller to manually override the autonomous function in case of emergency. Such an emergency shall be declared by the judge.
4. The transmitter-receiver should be able to work through polycarbonate sheets, metal bars and barriers. Remote Controllers with such facilities will only be allowed.
5. The team must have at least four frequency wireless remote control circuits or two dual control circuits which may be interchanged before the start of the match to avoid frequency interference with other teams. The case of any interference in the wireless system will not be considered for rematch or results.
6. Remote control systems available in the market can be used, While nonstandard or self-made remote control systems must first be approved by the organizers and judges.
7. Team should pair up the wireless remote with the robot before putting it into the arena. No extra time will be provided for pairing of transmitter and receiver once the robots are put inside the arena, and not connecting it prior to that may lead to Disqualification.



BATTERY AND POWER

1. The robot should be powered electrically only. Use of IC engines in any form is not allowed. On board batteries must be sealed and immobilized-electrolyte types of batteries should be used (such as gel cells, lithium, NiCad, NiMH, or dry cells).
2. The electric voltage between 2 points anywhere in the machine should not be more than 51V DC at any point of time. Participants will have to bring their own converters for standard power supply according to Indian standards. 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. In case of any emergency, the participants must stay calm and stay in the respective corners, the organizers will only be allowed inside the arena.
3. Use of damaged, non-leak proof batteries may lead to disqualification.
4. Change of battery will not be allowed during the match.
5. Robots with only on board batteries are allowed.
6. It is suggested to have extra batteries ready and charged up during the competition so that on advancing to the next round, there is no delay. If teams don't show up on allotted slots within the specified time limit, they will be disqualified.



PNEUMATICS

1. Robots can use pressurized non-flammable gasses to actuate pneumatic devices. Maximum allowed outlet nozzle pressure is 50 bar. The storage tank and pressure used by the team needs to be certified and teams using pneumatics are required to produce the Safety and Security letter at the Registration desk at the venue. Failing to do so will lead to direct disqualification.
2. Participants must be able to indicate the used pressure with an integrated or temporarily fitted pressure gauge. Also there should be provision to check the cylinder pressure on the bot.
3. The maximum pressure in the cylinder should not exceed the rated pressure at any point of time. All the pneumatic components must be rated at least value of maximum pressure.
4. You must have a safe way of refilling the system and determining the on board pressure.
5. All pneumatic components on board a robot must be securely mounted. Care must be taken while mounting the pressure vessel and armour to ensure that, if ruptured it will not spread out of the robot. The terms pressure vessel bottle, and source tank are used interchangeably.
6. Entire pneumatic setup should be on board, no external input (from outside the arena) should be given to the robot for functioning of its pneumatic system



HYDRAULICS

1. Robot should use only non-inflammable liquid to actuate hydraulic devices e.g. cylinders.
2. All hydraulic components on board must be securely mounted. Special care must be taken while mounting pump, accumulator and armor to ensure that if it is ruptured, direct fluid streams will not escape the robot.
3. All hydraulic liquids are required to be non-corrosive and your device should be leak proof.
4. Maximum allowed pressure is 50 bars*.
5. Participant must be able to indicate the used pressure with integrated or temporarily fitted pressure gauge.
6. Entire hydraulic setup should be done on board, no external input (from outside the arena) should be given to the robot for functioning of its hydraulic system



WEAPON SYSTEM

Robots can have any kind of magnetic weapons, cutters, flippers, saws, lifting devices, spinning hammers etc. as weapons (if they qualify the criteria mentioned below). All the weapons must have a safety cover over any sharp edges, all weapons should have a **weapon lock** to restrict the motion of the weapon when the bot is not in the arena and it should be removed only when the bot is ready on the arena.

Following weapons are exceptions and should not be used:

1. Solid and Liquid projectiles (bullets, foam, liquefied gasses, water, flame thrower).
2. Weapons causing invisible damage (Electrical weapon, RF jamming weapons and others).
3. Spinning Weapons:
 - Spinning weapons must come to a halt within 60 seconds of the power being removed using a self-contained braking-system.
 - Spinning weapons must only be tested in the arena, failing to adhere to this rule will lead to disqualification of the robot.
4. Spring-Loaded or flywheels:
 - The spring must always be free and unloaded, only during the match the spring must be loaded inside the arena. All testing must be in the arena only under the supervision of the organizing team.
 - All springs, flywheels, and similar kinetic energy storing devices must be controllable at all times. Any intended/unintended movement outside the arena or near the public may lead to disqualification of the team under safety violation.



COMPETITION RULES AND SPECIFICATIONS

TEAM SPECIFICATION

- Declaration form must be signed by team captain in order to participate
- A team can consist of a maximum of 8 participants. These participants can be from the same or different institutes.
- Team Name: Every team must have a unique name. RoboVITics reserves the right to reject entries from any team whose name it deems inappropriate, offensive or conflicting. 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 RoboVITics and the registered teams will be done through their team representative. The team representative must submit valid contact details (phone no, email ID, etc) at the time of registration.
- Robot's name cannot be changed during the whole course of the event.
- Robot name and photo should be submitted during the registrations. The submitted details will be cross-checked anytime during the entire course of the event.
- If a team has more than one robot in a single category, they must be visually distinguishable, this shall be checked at the start of the tournament, and any deviation from the original shall be punished with disqualification (Discretion of the judges).



COMPETITION RULES AND SPECIFICATIONS

TEAM SPECIFICATION

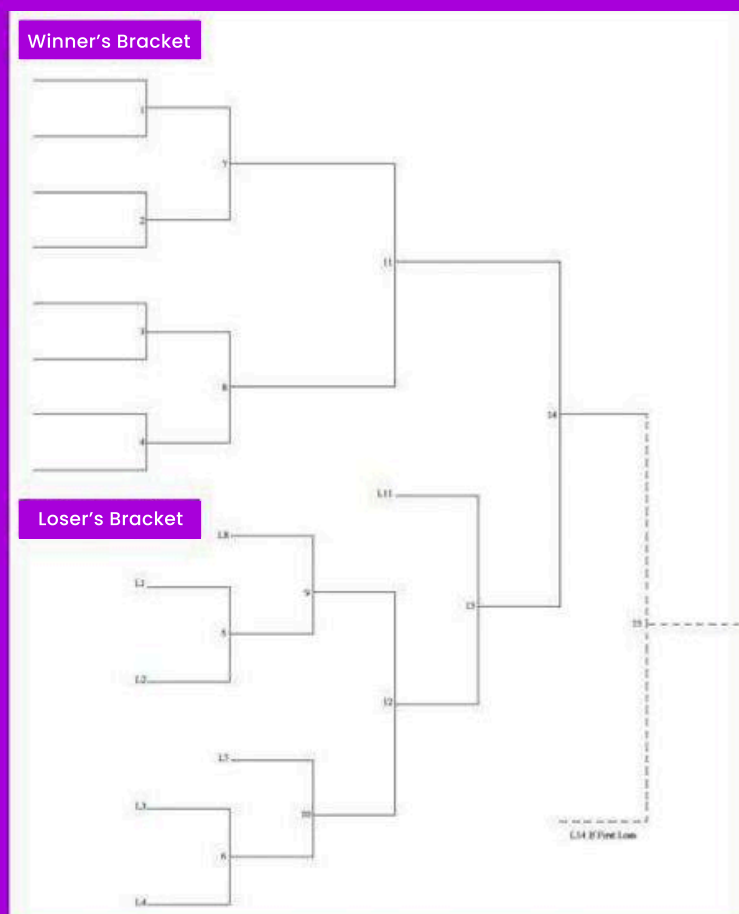
- If a participating team is entering two bots in the same category, it's required that each bot has a distinct pilot, the same pilot cannot operate both bots.
- In the event that two bots belong to the same participating team, it is imperative that their components and parts exhibit noticeable distinctions. Failure to achieve this can result in potential disqualification.
- All participating teams must present an abstract of the bot along with the bot that they are competing with, one, two or many.
- All bots will be inspected according to the abstract submitted by the team and it should meet the specifications produced by the respective team.
- Teams with multiple bots in the same category must compete with all bots and cannot withdraw one to advance another. No tapping out is allowed during matches unless a bot is immobile/partially immobile or the match ends. Bots must engage at least once every 20 seconds.

COMPETITION RULES AND SPECIFICATIONS

TOURNAMENT PROFILE

1. Double Elimination form of tournament will be followed in the competition.
2. The fixtures will be drawn by the judges in the presence of the organizing team to ensure a fair process. This will be done using a chit system to assign opponents in the fixtures.
3. Fixtures will not be changed under any circumstances. Any request to do so will not be entertained by the organizing team.

8 TEAM DOUBLE ELIMINATION





COMPETITION RULES AND SPECIFICATIONS

MATCH FREQUENCY, DURATION AND TYPE

- Each team shall be given 30 minutes between matches (Organizers reserve the right to change this duration on the day of the competition).
- This time is calculated from the time the robot leaves the post match staging area.
- If the team fails to return, with the robot ready, to the prematch staging area when called after the allotted time, the team will be forced to forfeit as per the discretion of the judges and organizers.
- Matches will be 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 it should sustain a 3 minute fight.
- The team members are not allowed inside the arena between the matches, if a bot stops working it will be declared immobile.
- Only if judges find that bots are stuck together and have no movement from any side then we will give 20-30 sec to let them separate by themselves under the say so and supervision of a judge/organizing team(roboVITics).
- It is recommended that any routine maintenance (i.e. battery charging) should be capable of being performed well within this time period, or backup should be kept. In extreme cases the 30 minutes time period may be lengthened at the discretion of the judges and event organizers.
- The weight of the bot will be checked before and/or after every match.



COMPETITION RULES AND SPECIFICATIONS

PRE-MATCH PROTOCOLS

1. Bots safety will be checked 1 night prior to the competition. This will be verified again before the match starts.
2. As per the judges' directive, robots must be functional and positioned near the arena no later than 15 minutes before the final call for the match.

PROTOCOLS DURING MATCH

1. During the match, a maximum of 2 people will be allowed near the arena on the robot driver's stage. Rest of the team must stay away from the arena and in the proper place designated by the organizing team.
2. Team members must not enter the arena under any circumstances. The organizing team will handle any mishap and only after the organizing team ensures the safety, teams can be allowed into the arena to retrieve their robots. Failing to follow this will lead to direct elimination irrespective of the match outcome (discretion of organizers)
3. The Weapon and the Robot should start moving only after the countdown is fully completed. If it is started in between the countdown, the judges and the organizing team has the right to restart the match or disqualify the team.



COMPETITION RULES AND SPECIFICATIONS

CRITERIA FOR VICTORY

1. A robot is declared victorious if its opponent is immobilized.
2. A robot will be declared immobile if it can not display linear motion of at least one inch in a timed period of 10 seconds or as decided by the judges. A bot with one side of its drivetrain disabled will not be counted out if it can demonstrate some degree of controlled movement. In such a case, if appealed by the opposing team and the judges deem it necessary, the match should be halted to check the controlled movement of the robot, if the control of the bot is satisfactory to the judges, the match will continue or else the match will be ended and the winner declared.
3. 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.
4. If a robot is thrown out of the Arena, and is not able to come back in, the match will stop immediately, and the robot still inside the Arena will automatically be declared as the winner. If a robot is immobilized on the side of the arena, the weapon must be stopped immediately. Causing damage to the arena intentionally shall be penalized.



COMPETITION RULES AND SPECIFICATIONS

CRITERIA FOR VICTORY

5. Robots can not win by pinning or lifting their opponents. Organizers will allow pinning or lifting for a maximum of 10 seconds per pin lift then the attacker robot will be instructed to release the opponent. If, after being instructed to do so, the attacker is able to release but does not, their robot may be disqualified. If two or more robots become entangled or a crushing or gripping weapon is employed and are trapped within another robot, then the competitors can make the timekeeper aware, the fight should be stopped and the robots separated by the safest means at the say so of the judges.

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

- a. **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 aggression.
- b. **Control** : Control means a robot is able to attack an opponent at its weakest point, use its weapons in the most effective way, 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 an opponent.
- d. **Strategy** : The robot exhibits a combat plan that exploits the robot's strengths against the weaknesses of its opponent. Strategy is also defined as a robot exhibiting a deliberate defense plan that guards its weaknesses against the strengths of the opponent.

NOTE : Qualification of a robot to the next round is subjective and totally on the decision of the judges.



COMPETITION RULES AND SPECIFICATIONS

CRITERIA FOR VICTORY

7. In case the match is stopped by a team member due to malfunctioning of a combat robot, the stoppage will be considered as a forfeit from the match and the opponent will be declared victorious. This is called forfeiting. Once a team forfeits, both the teams must stop their robot and weapon, failing to do so may lead to disqualification.

CRITERIA FOR VICTORY AT ALL TIMES THE JUDGES DECISION WILL REMAIN FINAL. ALL THE TEAMS MUST ADHERE TO THE SAME. THE ORGANIZING TEAM RESERVES THE RIGHT TO AMEND THE RULES AND ROUNDS ON THE DAY OF THE EVENT. FINAL SAY WILL BE OF THE ORGANIZING TEAM AND VIT MANAGEMENT. THIS WILL BE INFORMED TO THE TEAMS, THEN AND THERE



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:

1. If you have a robot or weapon design that does not fit in this rule set (even having some elements that are not mentioned as allowed/disallowed in this rule-set) or is in some way ambiguous, please contact RoboVITICS, VIT at the earliest. Safe innovation is always encouraged, but surprising the organizers with your brilliant exploitation of a loophole may cause your robot to be disqualified before it even gets to fight in the matches.
2. Each event has safety inspections. Your team will be allowed to compete at the sole discretion of RoboVITics authorities, to whom as a builder you are obligated to disclose all operating principles and potential dangers to the inspection staff.
3. Proper activation and deactivation of robots is critical. Robots must only be activated in the arena, testing areas, or with expressed consent of the event coordinators.
4. It is expected that builders will follow all basic safety practices such as shoes, gloves and goggles when operating any machinery/power tools. The use of welders, grinders and other equipment that may produce smoke, debris or other harmful substances is only permitted in dedicated workshop areas. Please take care of yourself and others around you. Any deviation from safety protocol shall lead to disqualification of teams.



IN CASE OF ACCIDENTS

1. In the case of any accident/emergency, the organizing team must be notified immediately.
2. The organizing team will take steps to mitigate the issue, please wait for the same. Please hold in such a situation for the help to arrive from the health center.

SAFETY AND VIOLENCE

1. Any kind of physical violence or verbal abuse or argument between teams or against the organizing team and VIT Management will not be tolerated. Anyone found in violation of this shall be warned and disqualified from participation in the competition.
2. All the work on the robots must be done in the pits (i.e. the place provided by the organizing team). Power tools also must be used in the place allotted for the same specifically. Care must be taken care by the teams to ensure the safety of themselves, and the public. Anyone found in violation of this shall be warned and disqualified from participation in the competition.
3. Violence, harassment and misbehaving against any female member within or outside team, organizing team or VIT is strictly prohibited and strict actions will be taken if found guilty.
4. In the aforementioned points, there will be a maximum of one warning per team before disqualification



DISCLAIMER

1. Organizing teams (RoboVITics) and VIT is not liable for any loss of items of the team.
2. If any damage is done to the VIT and organizing team's properties then the team will be held responsible and appropriate actions will be taken against them.
3. Teams registering multiple bots under the same category will be required to field and compete with all of them fairly. A team cannot deliberately disqualify one bot to allow another to progress into the next round. Similarly, tapping out during a match is strictly prohibited unless a bot is rendered immobile, becomes partially immobile, or the official match duration has concluded. Each bot is expected to engage with its opponent at least once every 20 seconds to ensure fair play and equal opportunity for all teams. Failure to engage may result in penalties or disqualification, as decided by the event judges. These rules are enforced to maintain the competitive integrity of the tournament, prevent unfair advantages, and ensure engaging battles for both participants and viewers alike.

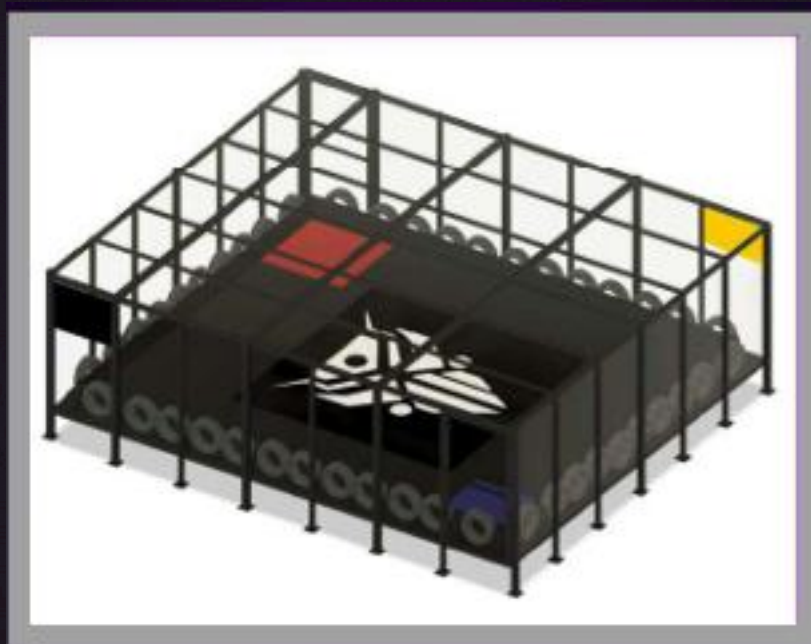


VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)



robotics

Arena





Event Specific Terminology

- **Disabled** : A robot is not functioning correctly due to either an internal malfunction, or contact with the opposing robot
- **Disqualification** : A robot is no longer permitted to compete in the current RoboWars Tournament
- **Immobilized** : In the judge's 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** : Occurs when neither robot makes contact with each other for a specified period of time.
- **Pinning** : Occurs when one robot, through sheer force, holds an opponent stationary in order to immobilize it
- **Radio Interference** : Refers to the situation where at least one robot becomes non-responsive or non-controllable due to the effect of the other robot's remote-control signal
- **Non-Responsive** : In a referee's opinion, the robot should not display some kind of 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.



Event Specific Terminology

- **Stuck** : A robot is hung-up on 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 causes the opponent's immobilization.
- **Timeout** : A temporary halting of a match. Timeouts are usually called to separate robots, but should be called for other reasons as well
- **Cluster Bot / Multiverse** : Participating teams having multiple bots can compete in their combined weight category, i.e., for example two 30kg bots of the same team can compete in the 60kg weight category.



Guidelines For The Matches

- The judge's decision is the last decision.
- If the lights are destroyed or damaged, the match will be instantly paused, and the judges will take over.
- The corners will be chosen through a coin toss
- You need to take permission from coordinating or organization team to test your bot in arena
- You cannot test your bot in the arena without appropriate approval of organizing team and judges.
- At least One of the members of the organizing team should be present while testing your bot.
- No weapon testing to be done inside the pits.
- Final weight check will be done just before putting the bot in the arena
- If any changes are made to the bot, the judges should be notified before the match.
- Marking scheme Marking scheme will be based on Judge's Guide Rulebook
- Striking or attacking an opponent's robot after a Tapout has been declared by their team will result in immediate disqualification.