OFFICIAL SUMOBOTS RULE BOOK

By **RAMSoc**

Changelog:

Date	Version Number	Changes
25/03/2023	1.0	Initial release
11/05/2023	1.1	Advanced rules and arena specs
10/06/2023	1.2	Advanced rules around servos
18/06/2023	1.3.0	Updated Ring specifications; including obstacles for the advanced stream. (NULL as of ver. 1.5)
18/06/2023	1.3.1	Blanket ban on magnets
29/02/2024	1.4	Added description of boss battles
22/06/2024	1.5	- Updated Ring picture and specs - Changed max. time for each round - Changed mode for Advanced Stream - Redefined the definition of a 'win' - Added 'Sumobots Game Modes'
07/03/2025	2.0	- Implemented Open Stream - Further defined 'body' and 'off the ring' - Added 'Testing Sessions' - Updated restrictions for both streams
12/04/2025	2.1	Added fuse requirement for sumobot
20/05/2025	2.1.1	Fixed wheel design stream clarification in 'General sumobots restrictions' (2.1.5)

Competition rules may be adjusted at any time if deemed necessary by the organizers.

1   Overview of the Sumo Match

1.1.1   Streams
The Sumobots competition consists of two streams:
> **Standard Stream:**
>> ● The standard stream is only available for UNSW students to participate in.
>
> **Open Stream:**
>> ● The open stream is available for both UNSW students and non-UNSW students.

Each stream has different restrictions which are covered below in section 2.1.2 and 2.1.3 respectively.

1.1.2   Overview of Sumobots
Two robots compete in a head-to-head match following the basic system of traditional human sumo matches. The sole purpose is a pushing match between the two robots to force the other from the arena. Robots are allowed no weapons (no sharp objects, no powered flipping, no projectiles, no sticky substances).

1.1.3   Overview of Sumo Matches
A match is fought between two teams, each team having one or more contestants. Only one team member may approach the ring; other team members must watch from the audience. The match starts at the judge's command and continues until a contestant wins two rounds. The judge determines the winner of the match.

1.1.4   Carrying Sumo Matches
1. Each match will have 3 rounds
2. Rounds will last a maximum of 2 minutes
3. Once the round start has been announced, robots shall wait 5 seconds before moving
4. The team who wins two rounds first shall win the match.
5. The judges will decide the winner of each round, and the winner of the match.
6. When a round is not won by either team within the time limit, an extended round may be fought during which the team who wins the round will win the match.
7. If an extended round match continues longer than 2 minutes without a winner, the judges will decide the match's outcome.
8. The placement of robots at the start of the match are set on opposing sides. See "Sumo Ring Specifications" for details on bot placements.

1.1.5 Definition of a Win

1. A round has been won by a team when:
   a. A team legally forces the body (any part of the bot) of the opposing robot off the ring (hitting the floor).
   b. The opposing robot has fallen outside the ring on its own.
   c. Either of the above takes place at the same time the match ends.
2. When a wheeled robot has fallen over while still in the ring or in similar conditions, a win will not be counted, and the match continues.
3. When judges' decision is called for to decide the winner, the following points will be taken into considerations:
   a. Technical merits in movement and operation of a robot
   b. Minor violations during the match (see "Violations and Penalties")
   c. Attitude of the players during the match
4. The match shall be stopped, and a rematch started under the following conditions:
   a. The robots are entangled or orbiting each other with no perceivable progress for five seconds. If it is unclear whether progress is being made or not, the judge can extend the time limit for observable progress for up to 30 seconds.
   b. Both robots move, without making progress, or stop (at the exact same time) and stay stopped for five seconds without touching each other. However, if one robot stops its movement first, after five seconds it will be declared as not having the will to fight. In this case the opponent shall be declared the winner, even if the opponent also stops. If both robots are moving and it isn't clear if progress is being made or not, the judge can extend the time limit up to 30 seconds.
   c. If both robots fall off the ring at about the same time, and it cannot be determined which fell first, a rematch is called.

1.1.6 Violations and Penalties

A team will be declared in violation of the rules if:

1. Their robot does not meet the specifications detailed in "Requirements for Robots" below.
2. A player utters insulting words to the opponent or to the judges or puts voice devices in a robot to utter insulting words or writes insulting words on the body of a robot or performs any insulting action.

Teams declared in violation of the rules shall lose the match and be ordered to leave.

A minor violation will be declared if a player:

1. Enter the ring during the match, except when the player does so to take the robot out of the ring upon the judge's announcement of stopping the match. To enter the ring means:
   a. A part of the player's body is in the ring, or
   b. A player puts any mechanical kits into the ring to support his/her body.

2. Performs the following deeds:
    a. Demand to stop the match without appropriate reasons.
    b. Take more than 30 seconds before starting the next round or rematch, unless the judge announces a time extension.
    c. Start operating the robot within five seconds after the chief judge announces the start of the match.
    d. Does or says that which disgraces the fairness of the match.

If a minor violation is declared twice in one match, a round win point will be given to the opposing team.

1.1.7 Testing Sessions
Testing sessions will be held at build sessions, where teams will be given the chance to test their sumobot (whether it is a prototype or completed) against another team's sumobot. This will follow the same format as the knockout and finals stage (more information in 1.1.5 Carrying Sumo Matches) and is open to both standard and open streams.

1.1.8 Injuries and Accidents during the Match
1. A player can request the match to stop when he/she is injured, or his/her robot had an accident, and the game cannot continue.
2. When the match cannot continue due to a player's injury or robot's accident, the player who is the cause of such injury or accident loses the match. When it is not clear which team is such a cause, the player who cannot continue the game, or who requests to stop the game, shall be declared as the loser.
3. Whether the match should continue in case of injury or accident shall be decided by the judges and the Committee members. The decision process shall take no longer than five minutes.

2 Requirements for Robots

2.1.1 Robot Specifications

Robots competing in the Standard and Advanced streams must have dimensions, weight, and budget less than or equal to that specified in Table 1 below.

Table 1: Robot Specifications

	Height	Width	Length	Weight	Budget
Standard	Unlimited	200mm	200mm	1kg	$200*
Opens	Unlimited	250mm	250mm	1.5kg	$200*

Does not include entry fee

2.1.2 Sumobot Fuse Safety
- Teams MUST include a working 1A-5A fuse connected to their battery to ensure safe power consumption

2.1.3 Open Stream Restrictions
Teams are given the following options for their budget:
1. Teams are given a budget of **$200** (this is not supplied by RAMSoc). Teams can purchase components which they believe will be useful in the creation of their Sumobot.
2. Teams have the option to purchase a base kit (this will include all the necessary parts to create a functioning Sumobot) from RAMSoc. As a result, this will reduce the team's budget to **$100**.
3. Sumobot cannot actively harm the opposing sumobot

Budget-Compliant Components:
- Teams must provide a list of purchased items to the organisers, which will be checked prior/during knockouts and finals
- Must contain details of:
    - Part Name
    - Part(s) Price
    - Link to purchasing website if applicable
- For your budget, make a copy of the provided scaffold. **Please put your team number in the title**
    - Alternative link:
      https://docs.google.com/spreadsheets/d/1_82_fSjtTY7Ylnn2JhjK63oNsZI6k7Yjm RS-oSsIEwk/edit?usp=sharing

2.1.4   Standard Stream Restrictions

Robots competing in the Standard competition:

1. Must use components only from the supplied kit and preapproved extras list. This list will be updated as the competition runs (so feel free to ask about adding something to this list) but will not be changed after week 4. It includes:
    a. Up to 3 extra IR sensors
    b. Up to 3 extra Ultrasonic Sensors
    c. Any additional non-powered wheels
    d. Anything purely cosmetic (e.g. LEDs)
2. Must not make modifications to the drivetrain.
3. Extra non-powered wheels are allowed

2.1.5   General Robot Restrictions

The following rules apply to all robots competing in Sumobots, including both Standard and Advanced streams.

1. Robots must be **autonomous** and not remotely controlled.
2. Robots must **not intentionally damage opponent robots**. Normal pushes and bangs are not considered intentional damage. Do not use parts that are dangerous.
3. **Jamming devices**, such as IR LEDs intended to saturate the opponents IR sensors, are not allowed.
4. Parts that could break or damage **the ring** are not allowed.
5. Devices that can store liquid, powder, gas, or other substances for throwing at the opponent are not allowed.
6. Flaming devices are not allowed.
7. Devices that throw things at your opponent are not allowed.
8. Sticky substances to improve traction are not allowed. For Standard stream, driven wheels/tires in contact with the ring must come from the Sumobots kit. For Opens stream, teams may design their own wheels however they must not use sticky substances to improve traction.
9. Devices to increase down force, such as a vacuum pump or magnets, are not allowed.
10. All **edges**, including the front scoop, must not be sharp enough to scratch or damage the ring, other robots, or players. In general, edges with a radius of greater than .005", as would be obtained with an unsharpened .010" thick metal strip, should be ok. Judges or competition officials may require edges that they deem too sharp to be covered with a piece of tape.
11. Magnets are not allowed.
12. Any other concerns should be taken up with mentors and organisers. If a sumobot is deemed too dangerous to be used in a battle by an Organiser, it will not be allowed to compete.

3 Sumo Ring Specifications

The ring used for matches will be the same for standard and advanced streams. Its specifications include:

1. The ring is circular, with 120 cm outer diameter and 115 cm inner diameter (black playing surface with 2.5cm thick white border line).
2. The ring is made of 18mm thick MDF, painted with spray paint.
3. Four different starting positions to choose from (see Figure 1). Each team must decide prior to the match and inform the judge. Teams cannot change their mind after confirming the position until the next round.
4. There should also be a space of suitable size outside the ring which must be void of objects and players, so that bots do not pick up false sensor data.
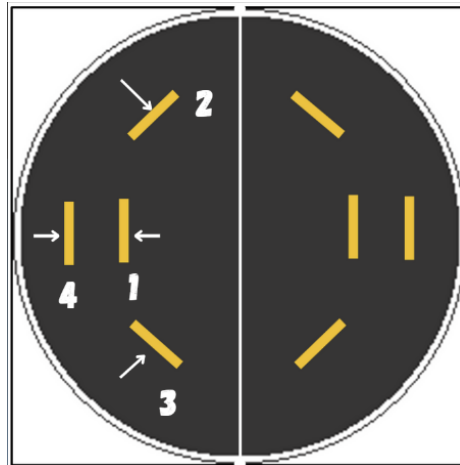

Figure 1: Top View of Sumo Ring.
Arrow indicates the direction that the main ultrasonic sensor OR ramp faces

4 Sumobot Game Modes

4.1.1 Boss Battles

Following the normal match rules, teams may choose to compete against Bossbots, provided by the RAMSoc subcommittee and the UNSW Makerspaces. The game mode presents itself as a tiered battle where teams can advance from tier to tier to gain rewards for each battle won.

The Bossbots follow the same rules as the advanced stream but are allowed to break ONE particular rule. This rule could be weight, dimension, sensors, or budget. They cannot, however, add mechanics that may damage competing bots. The Bossbots are created to pose a challenge to teams, but are aimed to not be impossible to beat.