

2019

Advanced



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Advanced 2019 Introduction

What is the Advanced Competition?

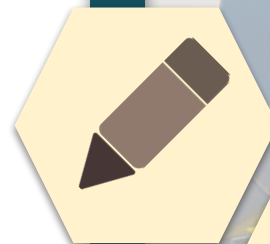
The Advanced competition is an engineering contest that combines electrical, mechanical, computer, and software disciplines into an exciting action-packed robotics event. McMaster Sumobot hosts this dedicated University-wide Sumobot competition every year for students to engage in a fun and competitive tournament where they show off their engineering skills and talents

Unlike the Beginner Competition held in March, students are expected to learn the necessary skills to build, code, and test their robots on their own. Furthermore, students are required to source their own parts as no Sumobot kits will be provided for the Advanced Competition. This year's Competition will be held in McMaster's Student Center on November 24th, 2019

What's new this year?

This year, we are revamping the trophies and prizes as well as adding additional awards to give credit to standout robots. However, these additional award categories will not be revealed until the event day!

We also have many new plans for the event that will make things more comfortable and result in less downtime in-between matches



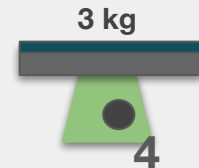
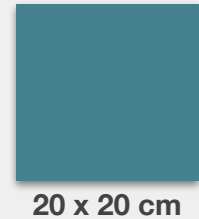
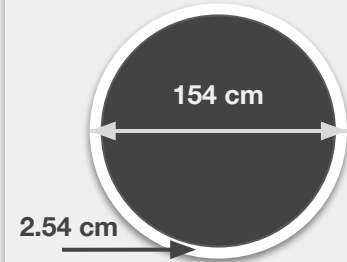
Rules and Restrictions

Ring Specifications:

- The ring shall be circular in shape, having a total diameter of 154 cm and a border width of 2.54 cm.
- The ring will be centered at the "ring area", a circular space with a diameter of 460 cm which no one is permitted to enter upon the start of the match.

Robot Specifications:

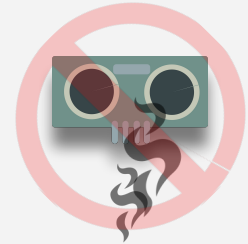
- The robot must fit within a square tube of 20x20 cm upon inspection during sign-in.
- The robot may expand in size autonomously upon the start of the round, but must remain intact as one piece. Screws, nuts, and other parts that fall off the robot during the round which total to *more* than 5 grams shall cause the loss of the round.
- The total mass of the robot at the start of the match must not exceed 3000 g.
- Robot must be fully autonomous. All methods of control must be contained within the robot without external signals or directions from outside sources once the round as started.
- Robots are to begin automatically five seconds after being activated.
- Robots starting before the five second mark will be asked to restart the round. Failure to comply will result in the forfeit of the round.
- Robots must be able to be safely turned on and off.



Rules and Restrictions

Robot Restrictions:

- A team whose robot does not meet these requirements will NOT be permitted to compete in the competition.
- Jamming devices, such as IR LEDs intended to saturate the opponents IR sensors, are not allowed.
- Parts that could break or damage the ring are not allowed. Do not use parts that are intended to damage the opponent's robot or its operator. Normal pushes and bangs are not considered intent to damage.
- Devices that can store liquid, powder, gas or other substances for throwing at the opponent are not allowed. Any pressurized substances are banned.
- Any flaming devices are not allowed.
- Devices that throw things at your opponent are not allowed.
- Sticky substances to improve traction are not allowed. Tires and other components of the robot in contact with the ring must not be able to pick up and hold a standard 8.5" by 11" sheet of paper for more than two seconds.
- All edges, including but not limited to the front scoop, must not be sharp enough to scratch or damage the ring, other robots, or players. Judges or competition officials may require edges that they deem too sharp to be covered with a piece of tape.
- Magnets are banned due to how they affect electrical components.





Rules and Restrictions

Restriction Changes:

Vacuums used strictly for downforce are no longer banned

A robot that has a vacuum installed must have additional specific mandatory installments, and go through a specified procedure involving passing a rigorous assessment to which the team will then receive a permit allowing them to participate in the competition with the vacuum device installed (refer to Appendix)

Explanation: While we do not expect any teams to incorporate a vacuum device in their design this year, lifting the ban will allow teams to conjure up ideas and designs for future competitions. While allowing vacuum devices calls for a multitude of additional procedures, we believe this change will make future generations of Sumobots multitudes more interesting. As students continue to optimize and refine their designs, they will find themselves researching, designing, and exploring a new subset of engineering involving high-revving rotational devices, pressure and aerodynamics.

Rules and Restrictions



Match Rules:

- One match will consist of three rounds.
- If the robot is unable to move after 10 seconds of activation, it forfeits the round.
- If during the round, a robot stops and stays stopped for more than 5 seconds, it forfeits the round.
- If two robots are caught in stalemate for over thirty seconds, the round is to end in a draw or be redone according to judge's decision.
- If two robots are caught in stall for more than 10 seconds, the round is to be redone.
- The match/round stops and resumes when a judge announces so.
- The robot to touch the floor outside the ring first loses the round.
- If both robots touch the floor outside the ring at about the same time, and a clear winner cannot be determined, the match can be redone or a draw can be called. **Underlined words are further explained in Appendix**

Team Etiquette:

- Teams must show respect to SumoBot organizers and to each-other.
- Insults will not be tolerated. Neither will cheating.
- Penalties range from verbal warnings to complete disqualification based on the severity of the infraction.
- If a team believes they have been unfairly penalized, their representative may appeal to the referee when the round is over.
- If the referee chooses not to revoke their penalty, the team will just have to deal with it. Any further objections may lead to additional penalization.

Registration



How can I register my robot for the Advanced Competition?

This year, Registration will be done on Eventbrite. You can register with Eventbrite directly through our Facebook page or on our website, and there will be links to the registration posted on our other social media as well. You will also be able to register at the Compass Information Center in McMaster's student center.

Every Team will be allowed to register UP TO two robots this year. Each robot will be treated as a separate contestant, and will have its own separate spot in the round robin.

Registration Officially opens Oct. 7th 2019 and will last until Nov. 10th 2019, two weeks ahead of the competition. You can find more information on the Eventbrite page.



Fees?

Registration for the Advanced Competition will have a fee of \$40 per robot entered. This will be needed for space and equipment rental, prizes, trophies, and more. These fees all go back to making this event as enjoyable/memorable as possible for you and your team



<https://www.facebook.com/MacSumobots/>



https://www.instagram.com/mac_sumobot/



<http://sumobot.ca/>8

Technical Resources



McMaster has a ton of resources to help you bring your robot to life. Whether it be 3D printing, circuit design, or general debugging, there are plenty of labs and workshops on-campus to help you create your Sumobot

Workshops: Hatch Student Workshop / Thode Makerspace / JHE Student Machine shop

Hatch Student Workshop - Hatch Center

- Open from 12:30 AM - 9:00 PM
- Requires Tier 1 Training, and in-person Orientation
- Hand/Power tools
- Machines and Woodworking

Student Machine Shop - JHE 115

- Opens 8:00 AM- 4:30 PM
- Orientation and training required
- Machinery Ex. lath, sheet metal press

Thode Makerspace - Thode Library Basement

- Open Mon - Thurs: 1:00 PM- 9:00 PM, Fridays: 10:00 AM - 6:00 PM
- 3D printer - Prusa Mk3 (Online Booking)
- Laser cutter - Trotec Speedy 300 (Online Booking)
- Soldering station
- Hand / power tools
- Electronics for rent (Arduino/Raspberry Pi)



Additional Services: IEEE McMaster Student Branch / Lyons New Media Center

IEEE McMaster Student Branch - ITB 141

- opens 9:00 AM- 4:00 PM
- for soldering, pcb, and other electrical resources
- Digikey orders with IEEE to split shipping cost

Lyons - Mills Library

- Open Mon - Thurs: 9:30AM- 9:30 PM, Fridays: 9:30AM - 5:30 PM
- 3D printing - Ultimaker 2+ (Online Form)
- Rent Circuit Scribe Kit/cables



Appendix



Vacuum Requirements

- The vacuum device must have a filter system. Objects that are sucked into the vacuum device shall not exit the vacuum device.
- A wire mesh that has an aperture of no greater than 3 mm must be installed in front of both the inlet and outlet vents of the vacuum device.
- If chosen to use a Vacuum device, Organizers must be notified at least a month prior to event date.
- The design of the device must be sent to the organizers for review no less than Three weeks prior to the event date.
- The device, including its filter system, must be demonstrated to our designated inspector no less than Two weeks prior to the event date.
- The device must be installed onto the robot with the required filter and wire mesh and demonstrated one final time to our designated inspector no less than One week prior to the event. Should the device pass the final assessment, a permit pass will be handed to the team, which must be presented while signing in their robot on competition day.

Appendix



Stalemate

A situation where both robots are not making any progress with the match. This could include getting stuck circling each other or being locked together and twirling in circles. Wheels are spinning, and both robots are moving.

Stall

A situation where both robots are caught stuck and unmoving as well as not making any progress. Wheels are turning either very slowly or not at all.

Links to McMaster Services

<https://www.eng.mcmaster.ca/engineering-research-machine-shop#Student-Machine-Shop>

<https://www.eng.mcmaster.ca/hatch-centre-student-workshop>

<https://library.mcmaster.ca/spaces/makerspace>

<https://library.mcmaster.ca/services/3d-printing>

<http://sites.ieee.org/sb-mcmaster/>

<https://www.msumcmaster.ca/services-directory/4-compass-information-centre>



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https://www.instagram.com/mac_sumobot/



<http://sumobot.ca/>

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