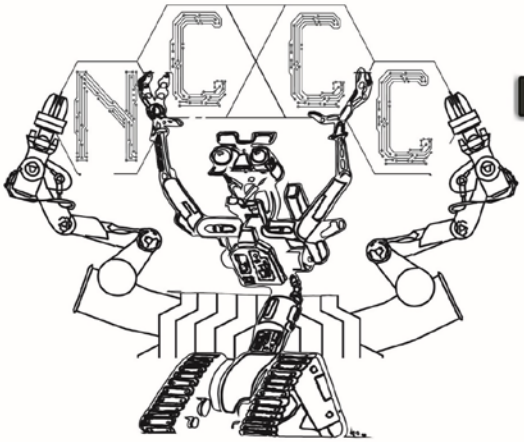


Tech Wars 2019

Niagara County Community College

Competition Category: R/C Capture the Flag 2019
Level of Competition: High School
Event Coordinators: Andrew Ellis and Noah Raymond (Lockport Schools)
Aellis@lockportschools.net Nraymond@lockportschools.net

Objective of Competition: Students design and build a robot following the guidelines listed below. In this contest, a team of three radio controlled robots face another team of three robots. The game will be played on a 16'x32' playing surface. The objective of the game is to drive over to your opponent's side of the field and capture a flag and bring it back to your team's side. The field will be made by duct taping sheets of 4x8 foot ¼" luan together. There will be a standard 2x6 inch border around the outside of the field.

Rules of Competition:

NEW

Changes to last years rules are colored RED!

***INSPECTION PRIOR TO COMPETITION:**

It is the responsibility of the teacher to bring in all robots from the participating school, **the night before the competition**, at NCCC for the inspection process. This should be between the times of 4:00 and 6:00pm. All robots will be secured in a locked room for the night and students will have access to their machines the morning of the competition. Robots will be accepted the morning of Tech Wars. DO NOT bring the remote controllers to inspection. Students can bring these with them the day of the competition.

Rules of Competition:

1. All teams who plan to participate will have to email Aellis@lockportschools.net with their radio frequency. A list of robot frequencies will be generated and placed on the www.wnytea.com website. First come first served; if your frequency is taken you will have to find an alternative crystal.
2. Each match will last 2 minutes.
3. Each team will start the match with their robots touching their defensive ramp.

4. There will be a 4 x 4 x4 cube of wood placed randomly on the center black line at the start of the match. This cube will be worth 11points if your team owns it at the end of the match (the cube is entirely in your half of the field).

5. There will be poison balls (standard size **5** soccer ball) located on top of both buckets in your end. Each ball will be worth -5 points if entirely contained on your half of the field. There are a total of 4 poison balls in the game.

Note about field: Buckets are weighted with stone to hold in place!

6. The white line has been replaced with a small ramp cut from a standard 2x4.

7. Teams are not allowed to enter or go behind their own end ramp (the entire robot over the ramp). If a robot enters this area or is pushed into this area an official will ask the player to drive out of the area then remove the player's controller and place it in jail for 30 seconds. If a robot is unable to drive out of the defensive zone within 10 seconds, the player will surrender their remote for the remainder of the match. If the Flag is blocked or held in any way by a defensive robot during the match, that robot will be disqualified for the match and surrender any team points won. The flag will be moved by a field official to a clear space in the defensive zone immediately after.

8. When a team is able to capture an opponent's flag and bring it back over the middle black line the match will end immediately and that team will be declared the winner.

9. In the event no team is able to capture their opponent flag the game will be decided by points from the center cube and all 4 poison balls.

10. The field will be set up as pictured in the drawing below.
11. The flag will be made from a standard 4x4 cut to 10" long.
12. The 5 obstacles on the playing field will be standard 5 gallon bucket that are weighted down with stone.
13. You must handle your own robot.
14. NO "time outs". You must be ready to compete, a full match, when called by officials.
15. Rules are subject to change. All revisions will be written in red and updated on www.wnytea.com.

Restrictions to Robots in Competition:

1. **NO REPEATS of projects from prior Tech Wars competitions!** Teachers please use your discretion on this and ensure that a robot from your school is not entered which has competed in prior years at Tech Wars.
2. **LIMITED MODIFICATIONS ALLOWED ON-SITE:** Students can use *small hand tools* which may include hammer, wire cutters, screw drivers and tape to do minor adjustments! Due to safety concerns of everyone at the competition there will be NO cutting, grinding, sawing, soldering or any other form of robot reconstruction allowed at the competition! This should all be completed before dropping the robot off at the pre-night inspection.
3. Robots must weigh ***25lbs or less*** with the battery. Official Scale is at NCCC. It's calibrated to 0.001 of a pound. If you think the bathroom scale you're using is not properly calibrated, you're probably correct! Be on the safe side, and build your robot much less than the 25 pound limit! This will ensure your robot weighs in under the 25 pound limit and you're not disqualified.
4. **SIZE LIMITS**: Student robots must be NO BIGGER than 24"x24"x24". Robots that are too big or too heavy will not be entered in competition.
5. **Only wheels are ever allowed to touch the playing surface (floor).** If any part of your robot other than a wheel touches the floor anytime during a match you will be immediately disqualified. Common sense will be used. Obviously if a robot is hit by another robot and touches the ground in some way it will not be disqualified. The floor will have imperfections but effort will be made to keep it in as good of shape as possible.
6. Electronic parts MUST be covered on the robot. Speed controllers and radio receiver have to be in some sort of case or have a hinged or pinned down lid on them. All wiring must be taped or tied down and NOT loose and dangling out or off of the machine! This rule is to protect the high value components of the bot from being damaged during the competition.
7. No explosives, corrosives, flames or pyrotechnics.
8. No lasers, projectiles, or radio jamming
9. No electronic weaponry such as stun guns, tesla coils, heat guns, etc.
10. No entanglement devices - string, tape, fishing line, nets, etc.
11. No liquid weaponry such as water, glue, foam, etc.
12. No physical interference or poor sportsmanship between competitors.
13. No magnets or electromagnets - may cause radio interference
14. No cutting devices - Any major damage to the arena will result in disqualification
15. Electronics must be visible, securely fastened and safe from damage.
16. No sharp edges on exterior of robot

Material Requirements: Per Robot

1. Use typical materials found in lab (plywood, plastic, sheet metal, etc.)
2. **(1) Sealed lead acid 12 volts battery with a maximum 7Ah rating: such as Tower Hobbies Torqmaster LC 12 volt, 7 Ah Maintenance-free Lead Acid Battery from Tower Hobbies.**

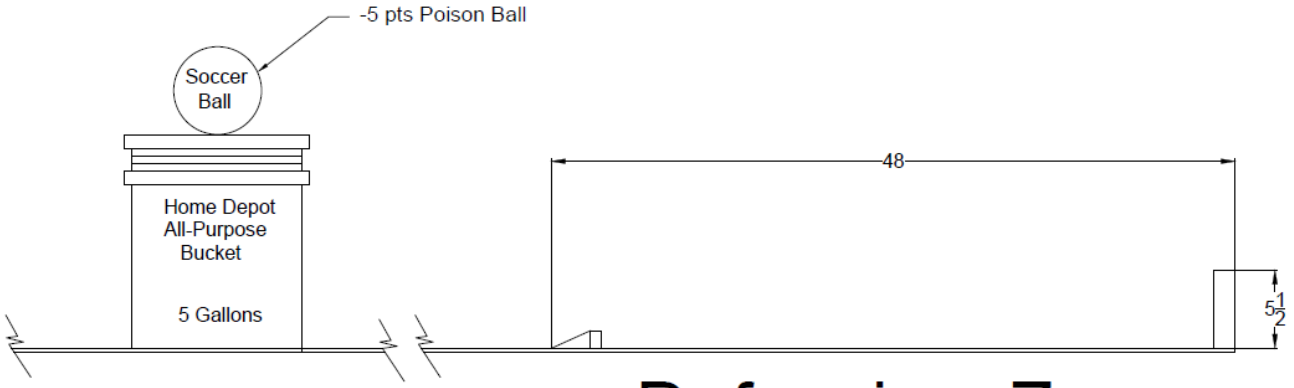
   Batteries must be visible for inspection.

3. Unlimited – speed controllers such as: Innovation First Motor Speed Controllers (you can use others)
4. Unlimited – electric motors and gearboxes such as: Fisher Price Motors/Gearboxes (you can use others)
5. 1 – On/Off Power switch (should be easily accessible)
6. Paint Robots (not required) – your school colors and no offensive designs.
7. 1 - **replaceable frequency crystal** radio control system AM, FM, Surface or Air: transmitter, receiver, and battery pack**. (Variable Frequency Crystal are allowed)**
8. All other materials and design is up to the competitor.
9. There is no limit to cost of materials.
10. You must supply your own chargers.

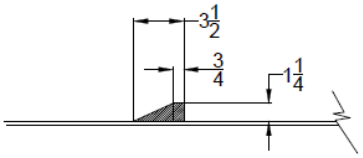
Tournament Format: (3 vs 3)

1. All teams will play multiple games with different partners.
2. Teams will be ranked at the end of the regular season by their win/loss record, and amount of times a flag was captured.
3. The top 4 qualifiers will become playoff team captains.
4. There will be a draft following the regular season were 12 teams will make the playoffs. There will be an alternative team drafted by each team in case a robot is unable to continue to compete.
5. The team captain of the winning alliance will be declared 1st place. The first pick by that captain will get 2nd place and finally the last pick by the captain will get 3rd place.
6. The top 4 team captains may decline being drafted by another team to maintain the ability to get a 1st place victory. If any other competitor declines the draft they are eliminated from the competition.
7. Scouting of other robots is strongly encouraged.
8. There will be a standard single elimination playoff (1 vs 4), (2 vs 3). The winners of these matches will face each other and claim 1st, 2nd, and 3rd places**. This format can change depending on the number of robot entries.**

Questions regarding the event please contact:
Mr. Ellis or Mr. Raymond – Event Coordinators
aellis@lockportschools.net



Defensive Zone



Defensive Ramp Detail

(Ramp Dimensions Approximate)

Capture the Flag Field