



# 2012 ROBOT GAMES



## OFF-ROADBOT CHALLENGE

***Western Canadian Robotics Society***  
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**The rules of engagement for the new Off-Road Challenge for the 2012 Western Canadian Robotics Games**

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## Overview

Autonomous robots will race over rough ground to determine which can be the first to cross the finish line. Along the way they must avoid each other and any obstacles they encounter. Remote control is not allowed; non-autonomous constructs will be left to other clubs.

## Course Map



Figure 1 – Overhead Map

The **Red area** indicated the course perimeter. The area is approximately 100m in width and 70m in length. In case of the area being flooded, the parking lot to the south (**orange area**) may be used as a backup course.



## Course Summary

- A rope will be placed on the ground near the North East end of the field to serve as the starting line.
- A sheet of plywood will be placed either side of the gate in the fence at the South West end of the field. One side will be green, the other side blue. The plywood will provide a solid object for proximity sensors.
- An opening approximately 3 meters wide will be left between the two sheets of plywood. Robots may use the color to identify/target the location of the finish line if they wish. The different colors can be used to determine the left or right side of the gate.
- Competitors and their robots will set up behind the rope.
- Competitors may survey/map the field before the event.
- Competitors will be penalized if they touch any robot during the event.
- Robots are free to use GPS, compass, inertial navigation or whatever desired.
- No marking of the field inside the fence will be allowed.
- If desired, Competitors may place location markers, radio beacons etc outside the fence or at the gate provided:
  - They are not moved or altered during the race.
  - They do not obstruct the view of the red plywood markers at the finish line.
  - They do not intentionally interfere with other competitor's navigation systems.
  - Competitors may not intentionally jam the navigation signals of other robots.
- Orange/red traffic cones or similar markers may be placed on the course. There will be a two second penalty if a robot bumps one of these markers (it might just be marking a real hazard).
- There may be other obstacles on the course, but there is no penalty attached for contact.
- These rules may undergo small modifications up until one month before the games.

***See Appendix A for photos of the area.***



## The robots

- Electric or mechanical propulsion systems can be used
  - Combustible fuels are currently not allowed for safety reasons
- Any ground based propulsion (tank tread, walking, or wheels) allowed.
- Robots must not in the opinion of the judges present any danger to spectators.
- Robots must not exceed one meter in size in any dimension at any time during the race.
- Competitors may not at any time move their robots in excess of 1m of space, and must not move them in a direction closer to the objective

## The Race

1. At the whistle, the robots will start, and drive over the rope.
2. Competitors may not interact with their robots after the whistle until the contest is over. If the competitor has to touch their robot, a time penalty will be incurred. See penalty section.
3. First robot through the gate (between the colored boards) wins (After any penalties are added).
4. Robots may not intentionally damage other robots. Blocking is allowed. Pushing is not.

## Penalties

- There will be a two second penalty if a robot touches one of the orange/red markers.
- There will be a five second penalty if a competitor touches their robot.
- There will be a 15 second penalty if a competitor inadvertently touches another robot.
- A competitor will be disqualified if they deliberately touch another competitor's robot.
- A competitor will be disqualified if they send remote control signals to any robot.

## Prizes

- Fastest on ground autonomous (first, second, third)
- Fastest walking autonomous
- Most creative engineering.



# APPENDIX A

## Photos





Figure 2 - West ridge of course closest to the Aerospace Museum



Figure 3 - Gravel Area in the center of the course





Figure 4 - East side of course



Figure 5 - Southeast corner of course





Figure 6 - Central / Southwest corner of course



Figure 7 - Parking Lot (Backup area if course is flooded)