

## PACISE 2018

### Robotics Competition Details

#### Part I

Follows a black line approximately 1/4" wide around a race track twice. The starting point of the track will be marked by two green lines 1" apart. Each green line is approximately 1/4" wide. NOTE: Effort will be made so that the color sensor registers the green tape as green and the black tape as not green.



Figure 1 - Example Track for Part 1

Robots will be scored based on time it takes to complete two trips around the track. Robots that don't make it around the track in time (approximately 5 minutes) will be scored based on distance covered. Robot needs to come to a stop after the second trip is completed.

#### Ranking:

First Tier: Robots that completed the objective, shortest total time gets highest ranking.

Second Tier: Robot that makes it the furthest around the track, or completed both laps but did not stop. Ties broken based on shortest time.

#### Part II

Robots can only attempt Part II if they first successfully complete the track in Part I.

Follow a black line approximately 1/4" wide to a green square where there is a block in the center (see Figure 2). The robot will grab the object then return back to the starting point. The starting point of the track will be marked by two green lines 1" apart.



Figure 2 - Approximate Layout for Part II

The green lines are approximately 1/4" wide as well. The blue square in Figure 2 represents the block (2" H x 1" W x 1" D) to be grabbed.

**Ranking:**

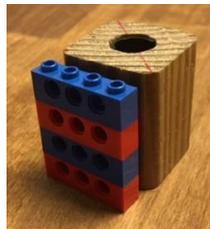
First Tier: Robots that completed the objective, shortest total time gets highest ranking.

Second Tier: Robot grabbed the block but could not return to the start point or moved over the start point and did not stop. Closer to the start point, the higher the ranking, ties broken by time it took to get there. Robots that moved over the start point have a distance of zero from the start point, but are not considered to have completed the objective.

**Part III**

Robots can only attempt Part III if they first successfully complete the task in Part II.

There will be an IR Beacon setup in beacon mode that the robot will need to find. The course will be marked out in black lines approximately 1/4" wide. The course will have two rooms, in one of which will be the IR Beacon, represented as a red rectangle in Figure 3. The robot must find and enter the room with the beacon to retrieve a small block (2" H x 1" W x 1" D):



The block is represented as a blue dot in Figure 3. The block will be on the black line in the middle of a green square. The robot must then take the block back to the beginning of the course. The beacon will be placed approximately 2-3" directly behind the block. Final distance to be determined during spring break when the maps will be constructed; update on placement will be specified then. Beacon will be resting on top of a similar sized block (so bottom of beacon is about 2" off the ground) so that its signal travels directly over the top of the block.

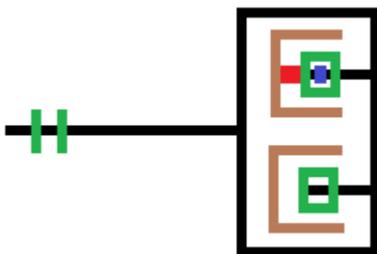


Figure 3 - Approximate Design for Part III

Robots will be scored based on time it takes to complete two trips around the track. Robots that don't make it back in time (approximately 5 minutes) will be scored as follows:

1. Closest distance to the room with the beacon
2. If got the block then closest distance to the start point.

The contest will be held in a room that does not have any windows to the outside to eliminate interference from sun light for the IR sensor.

**Ranking:**

First Tier: Robots that completed the objective, shortest total time gets highest ranking.

Second Tier: Robots that got the block, closest to the start point gets the highest ranking.

Third Tier: Robots that did not get the block, closest to the room gets the highest ranking.

**Overall Ranking**

Each robot will be ranked in order for each part (see each part for details). The overall ranking of the robot will be a sum of these rankings, with the lowest overall ranking being the winner and so on. For example, if a robot was ranked 2nd overall in part I, 1st in part II, and 5th in part III then that robot's overall score would be 8. Any ties will be broken by total time the robot took for all three parts.

**NOTES:**

**Tape:**

Effort will be made so that the color sensor registers the green tape as green and the black tape as not green.

Using 3/4" Black Electrical Tape for the black lines.

Using 3/4" Neon Green or Lime Green Duck Tape for the green lines (Found mine at Michael's).

<https://www.tapeplanet.com/Neon-Green-Lime-Duck-Tape-Duckling-p/stdtpl-282319.htm>

**Color Sensor:**

Color Sensor Position: ~ 1/2" from ground

Black Tape: 1

Black Tape + Surface: 2

Surface: 6

Green Tape: 3

Green Tape + Black Tape: 1

Green Tape + Surface: 2

Touch Sensor Notes:

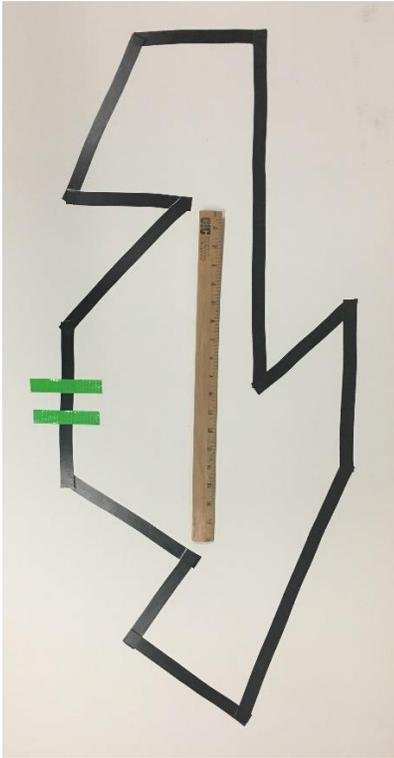
Block is too light to trigger the touch sensor

**IR Sensor:**

More testing to be done next week, will send out data near the end of the week before the start of spring break.

# Photos of actual tracks

PART 1



PART 2



PART 3

