



# Donut Drag

## Game Rules and Description



### Schedule of Events

<b>8:00 am - 9:00 am</b>	Registration and photos
<b>9:00 am - 9:15 am</b>	Welcome in the Vectren Auditorium
<b>9:15 am - 10:45 am</b>	Competition in the Vectren Auditorium/Student Commons
<b>10:45 am - 11:00 am</b>	Break
<b>11:00 am - 11:45 am</b>	Competition in the Vectren Auditorium/Student Commons
<b>11:45 pm – 12:00 pm</b>	Awards ceremony in the Vectren Auditorium

### The Game

This year's game will be a variation of the game being used at the sanctioned Vex competitions – Tipping Point. We will use the donuts, trees, and balance bridges from the official game set to make up our own challenge. The challenge will be in a 12 foot by 12 foot arena made of foam pads on the floor surrounded by PVC walls. The donuts, trees, and the teeter totters are the actual game pieces. No to-scale graphics are provided, but dimensions can be found by looking up the Tipping Point games. In the Tipping Point game, the pieces are called rings, mobile bases, and balanced alliance platforms.

The goal of the competition is to move as many donuts from their starting point to your home base. 76 Donuts will be on the ground level and up in trees. The number of donuts in trees will be set, but placement on the ground may differ from round to round. You will get points for each donut that you can get within the confines of your area. Note that your home base area is small and contains a tree, so you might have to find ways to store the donuts in the tree.

At the end of the round, each robot should make its way to their balance bridge and ensure both ends of the bridge are off the ground when time runs out.

Two robots will be on the course at a time, but the scores will be cumulative of all the rounds.

### Teams

Teams can enter either the novice or the advanced challenges. Teams must consist of four student members (4<sup>th</sup> – 12<sup>th</sup> grade) and an advisor. All 4 student team members will operate the robot in this competition. If a student team member does not show up or has to leave early, then a substitute may be used. A substitute is a student (4<sup>th</sup> – 12<sup>th</sup> grade) that is not competing on another team. If a substitute cannot be found by the time the competition rounds begin, the team may participate, but may not win any round.

At check-in, each team will fill out a lineup card that indicates the order of the drivers.

## Rules

Two members of the team will drive the robot in each round for a minimum of 45 seconds. After each interval, the controls will be passed onto the next driver. Judges will indicate when the minimum time is up for the first driver.

Robots can only hold or control five (5) donuts at a time. If more are picked up, they must be immediately returned to the playing field in the same vicinity as to where they were picked up. Once donuts are dropped off in the home base, more can be picked up. Control is defined as keeping the donuts in close enough proximity that the other robot risks contact if it tries to take the donut.

Donuts in the home base at the end of the round will be counted.

If the robot is able to balance on their own balance bridge such that both ends of the bridge are off the ground when time runs out, then points will be awarded.

The combined best score of the rounds will determine the winner.

Robots are to stay within the confines of the course but can reach over the PVC walls if desired.

Parts on the course may fall over or even fall outside the confines of the arena during play. Only the robot can touch these items to try to move them. If anything falls outside the arena out of reach, then it will be off-limits for the remainder of the round.

Competitors may not take donuts from the opponent's home base or cross into the opponent's home base for any reason.

The team members are allowed to adjust, move, and repair the robot as needed until the start of the round. During the round, no one may touch the robot except at the direction of the judge. After the round, the robot may be taken out of the auditorium for adjustment.

No re-starts are permitted. If the robot does not work at start up or has any other issue, at the judge's discretion, the team may intervene, but the timer will continue.

The robot must not pose a danger to anything on the course. The judge may call for a robot to be powered down or removed if it is getting close to causing damage. Points for that round will not be counted.

Two robots will be on the course at the same time. Robots are not permitted to hit or attack each other in any way. All contact is to be avoided.

The decisions of the judges and the competition director are final.

## Points System

Points are awarded according to the following table based on the position at the end of the period.

Points for donut on ground	1
Points for donuts in the base	3
Points for donut in tree	5
Points for balancing teeter totter	12

## Rounds

The competition will consist of four or five rounds of 2 minutes each. The order of teams will be randomized. There will be a maximum of 15 teams. The order will be handed out before the competition starts.

The Announcer will call out the team names when they are to come forward. The announcements are not heard outside Vectren Auditorium and it is the teams' responsibility to be ready in time for their round.

Rounds will be forfeited if the teams are not ready when called by the announcer.

The top teams from the round robin will go head to head for the championship.

## Tie

In the event of a tie, the tied teams will run an extra round at the same time as each other.

## The Robot

Teams are allowed to use only VEX parts that are available in one standard Vex IQ or EDR kit except as otherwise noted. The number of these parts used is not limited except where noted. Motors/servos must be VEX and is limited to 5 motors.

If the VEX Cortex robot needs to be tethered during play, any common USB cable may be used.

**Robots may be inspected for the compliance to the rules at any time.**

Robots may be repaired outside of the auditorium in between rounds.

Any part may be substituted or added/subtracted between rounds.

## Robot Identification

Each robot shall have a team sign or flag that identifies the robot (team name).

- The sign or flag must be securely fastened to the robot
- May be made of non-kit materials
- Must be readily visible when robot is operating
- The sign or flag must be non-functional and if the judges deem that the sign or flag is used in the competition, the team will lose that round.

## Batteries

Third party batteries may be used, as long as they are 7.2 V and have a capacity of no more than 3000 mAh. **It is recommended that teams have spare, charged batteries (it takes about 3 hours to charge the batteries).** It is also recommended that teams get the higher capacity VEX batteries (7.2 V, 3000 mAh). See: <http://www.vexrobotics.com/products/accessories/power/276-1491.html>, these batteries require the VEX Smart Charger. See: <http://www.vexrobotics.com/smart-charger.html>

## Tethers (not applicable to VEX Cortex Microcontrollers)

All robots must be tethered unless competing (a tether is a basic phone handset cord with modular plugs on each end). Teams must supply their own tether. Any standard phone handset cord should work from Target, Walmart, Radio Shack, etc. Make sure it works before the day of the competition.

## Transmitters and Crystals (not applicable to VEX Cortex Microcontrollers)

Remote controls should not have a transmission crystal in them at any time inside the competition building. All teams will present their remotes and robots to the head referee for crystal assignment before each match. All crystals must be returned to the field referee after each match. Only VEX transmitters and receivers shall be used.

## Tools and Spare Parts

Teams must supply their own tools and spare parts. Repairs must be done outside of the auditorium unless the judge allows an adjustment during the round.

Team may use tools to reset or adjust their robots during their round as well as before/after. Penalties may be assessed if teams fail to clear out of the competition area in a timely manner for the next team to compete.

## Covid

Ivy Tech reserves the right to make any changes necessary to comply with current COVID protocols.

All people that enter Ivy Tech's building must wear a mask over their mouth and nose at all times. Exceptions can be made for short periods of time while eating or drinking, but unmasked times are to be minimized.

All participants are asked to socially distance as much as possible.

## **Practice Time/Open House**

No practice time will be available this year.

To help test the robots, 3D printed donuts are available (one per team). These are not the same material, weight, or texture as the real donuts. Please note that the claw does not do a good job of picking up these donuts.

## **General**

There will not be pizza for sale this year. The vending machines will be open.

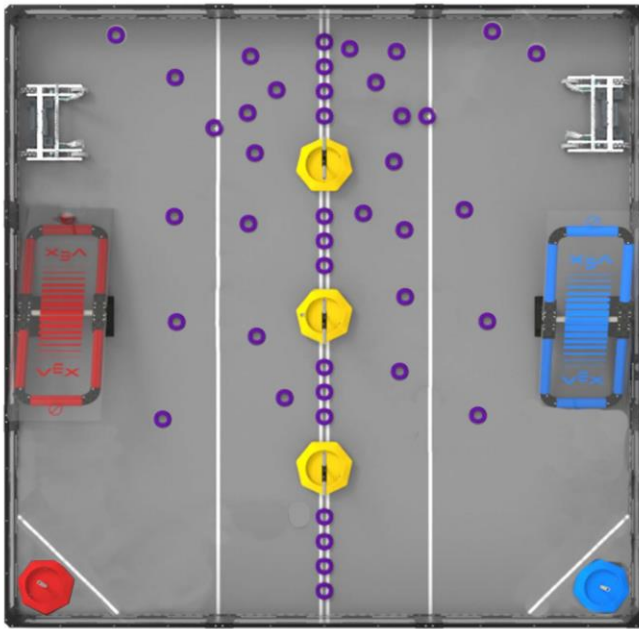
All participants must behave as adults and treat the Ivy Tech building with respect. Behavior that distracts other people will be dealt with by security and may include being removed from the premises.

The first two rows of seats are reserved for the advisors/parents/classmates/etc. of the teams competing at that time. Please vacate these seats as soon as your team has competed so the next team can have their fans come close to watch. Please keep the center aisle clear at all times.

## **Questions**

Any questions regarding this competition may be submitted to Donna Zimmerman at [dzimmerm@ivytech.edu](mailto:dzimmerm@ivytech.edu).

## The Fields



- Robots will start at the designated start area.
- Home bases are shown in the lower corners. Dimensions are approximate.
- Robots can pick up any donuts that are not in a home base.
- Donuts will be scattered approximately evenly between the two sides.
- All trees will have the configuration shown.