



THEME BOT CHALLENGE RULEBOOK



<https://www.technoxian.com/themed-bot-challenge>

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THEMED BOT CHALLENGE

ThemedBot Challenge is TechnoXian 9.0's newest category where innovation meets mission! Each year, a unique theme is unveiled, and teams must design one robot to solve it. One task. One chance. Limitless creativity. Are you ready?

TechnXian 9.0 Theme: AGRIBOT

1.0 Competition Overview

The AgriBot Challenge at TechnoXian 9.0 simulates an advanced agricultural automation task, where robots are required to identify and pluck artificial apples from trees and deposit them in designated collection containers. This challenge evaluates design, object detection, actuation precision, real-time decision-making, and autonomous operation. It mimics smart farming scenarios aimed at enhancing efficiency and reducing manual labor in agriculture.

2.0 The Team

Tournament Teams and Team members are subject to the following:

2.1.0. Team Name

All Team names must be approved by TechnoXian and must be unique, non-offensive, and free of commercial trademarks unless authorized. TechnoXian may request renaming of inappropriate names. Approved names cannot be changed without written permission.

2.2.0 Team Composition

A team may consist of 1 to 10 members, including programmers, fabricators, designers, and operators. Each team must appoint one Team Leader.

2.3.0 Technical Expertise

At least one or more members of the team must possess the technical knowledge to design, code, and troubleshoot the AgriBot.

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At least one or more members of the team must possess the technical knowledge to design, code, and troubleshoot the AgriBot.

3.0 The Field

3.1.0. Arena Dimensions

- **Apple Tree Zone:** Centre area with artificial trees with hanged apples (different colours: red and green).
- **Two Container Zones (one for each Union) with:**
 - Red Container (for red apples).
 - Green Container (for green apples).
- **Pathway:** Obstacles and uneven surface to simulate farmland.
- **Tree Height:** Maximum 140 cm (approximately) from ground level



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4.0 The AgriBot

Teams must design and build a robot as per the following criteria:

- The robot must **be manual and to be controlled remotely (wireless)**. Teams also **have choice to design autonomous bot**.
- Dimensions: Maximum **45cm x 45cm x 45cm**.
- Maximum Weight: Not exceeding **20kg**
- The robot must operate on **battery power only** (Maximum 15V, 5A).
- Plucking mechanism must be non-destructive and demonstrate accuracy.
- The use of cameras, color sensors, and proximity sensors is allowed and encouraged.
- Commercial robot kits are **not allowed**; custom design is mandatory.

5.0 Competition Structure

5.1.0 Referee

The referee oversees competition play, validates scoring, enforces rules, and ensures fair play. Only team leaders are allowed to interact with the referee.

5.2.0 Assistant Referee

Assists the main referee by observing rule violations and maintaining time logs.

5.3.0 Team Roles

Each team must declare the Team Leader and Operator before the round begins.

5.4.0 Preparation

Teams must arrive 10 minutes before their scheduled time for:

- Inspection of AgriBot
- Final calibration
- Arena briefing
- Assignment of team marker colors (e.g., blue/ red)

6.0 Game Flow

6.1.0 Countdown to Start

Referee confirms both teams are ready. Teams show a green card to indicate readiness.

6.2.0 Faults and Restarts

Early movement or system failure results in a restart. A maximum of 1 restart is permitted per team, per round.

6.3.0 Timeout

Timeouts can be called for safety or technical disruption. Teams must freeze movement immediately.



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7.0 Gameplay and Scoring

7.1.0 Qualification Round (each team takes part in several games, each lasting 3 minutes)

- Robot must navigate to designated trees zone.
- Detect, identify, and pluck artificial apples.
- Apples must be placed in respective containers (Red and Green).
- Each successful pluck and correct deposit scores points.
- Bonus points for sorting all apples correctly.
- Bonus points for 100% autonomous execution.
- Penalty for holding (controlling) more than two apples at a time.
- Penalty for dropping an apple in a container of another Union.
- Top scoring teams move to Final Round (the number of teams depends on the total number of participants).

7.2.0 Finals Round (each team takes part in several games, each lasting 3 minutes)

- Robot must navigate to designated trees zone.
- Detect, identify, and pluck artificial apples.
- Apples must be placed in respective containers (Red and Green).
- Each successful pluck and correct deposit scores points.
- Bonus points for sorting all apples correctly.
- Bonus points for 100% autonomous execution.
- Penalty for holding (controlling) more than two apples at a time.
- Penalty for dropping an apple in a container of another Union.
- Top scoring teams move to Final Round (the number of teams depends on the total number of participants).

7.3.0 Scoring Parameters

- Apple Plucked: 10 points
- Correct Container Deposit: +10 points
- Wrong Container Deposit: -5 points
- Drop Outside Container: -3 points
- Tree Damage (or Shaking): -10 points
- All Apples Sorted Correctly Bonus: +20 points
- 100% Autonomous Execution Bonus: +20 points
- Holding More Than Two Apples Penalty: -10 points
- Apple Drop in Opposing Union Container Penalty: -10 points

7.4.0 Tie Breaker Criteria

- Autonomous over remote
- Fewer penalties



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8.0 General Tournament Rules

8.1.0. Prohibited Activities: TechnoXian expects all Competitors to act in a safe and legal manner. The actions of a single Team member may be grounds for Disqualification or Expulsion of the entire Team. The following activities are prohibited; violation of any of these terms may result in Competitor and/or Team Disqualification, as determined by TechnoXian. and/or Producer in their sole and absolute discretion.)

- **Unruly Behaviour:** Fighting, belligerence, threat of physical violence or other unruly behaviour, including abusive physical contact with any TechnoXian Official, will not be tolerated and can result in the immediate Expulsion of the offending Team member's entire Team from the Tournament.
- **Vehicles in Pit Areas:** Scooters, bicycles, skateboards, skates and similar vehicles cannot be used in any of the Pit Areas. In addition, powered vehicles such as Segways, hoverboards or powered scooters cannot be used or stored in the Pit Areas. The only exceptions are wheelchairs (manual and powered) occupied by disabled persons, and vehicles used by authorized personnel for Tournament operations.
- **Running and Playing:** Running in the Pit Area, except in an emergency, is not allowed. Running while carrying a charged pneumatic tank, or any sharp or otherwise dangerous part, may result in the revoking of the Pit Pass of the offender. Engaging in horseplay, tossing balls or other items, or operating remote-control vehicles or equipment in the Pit Area is also not allowed.
- **Team Property:** No Team member may deliberately touch, handle or otherwise come in contact with any Drone, parts, tools or other equipment belonging to another Team, without the explicit verbal authorization from a member of the other Team
- **Smoking:** Use of either tobacco products, nicotine vapor devices (e-cigarettes) or similar non-nicotine delivery devices is specifically prohibited in any of the Pit Areas, and in any other indoor or nearby outdoor area that is marked as "No Smoking".
- **Alcohol Use:** No alcohol may be consumed at the Tournament by any Team member at any time. In addition, no alcoholic beverage may be brought into any of the Pit Areas. A Team member under the influence of alcohol is not allowed in any of the Pit Areas,.
- **Illegal Drugs:** No possession of illegal drugs or other substances or any use thereof will be tolerated at any time or place during the entire production, on camera or off. Penalty is immediate dismissal of the entire Team of the offender from the Competition and Program.
- **Firearms and Explosives:** No firearms, weapons, explosives or other dangerous items or materials of any kind may be possessed or brought to any Tournament location by any Competitor or anyone else other than authorized law enforcement personnel.



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- **Lasers:** Deliberate pointing of any laser at any other person at the Tournament will not be tolerated and may result in the immediate Expulsion of the offending Team member's entire Team from the Tournament.
- **No Pets:** No pets of any kind are allowed anywhere at the Tournament. The only exception is a certified service dog being used to assist a disabled person.

8.2.0. Prize:

Winner of the tournament will be awarded cash prize, certificate and trophy. TechnoXian reserve the right to make changes to the total prize pool amount and/or the prize pool allocation prior to the commencement of the Tournament.

- **Prize Forms:** Each Team Member will be required to fill out and sign his/her Team's Team Member & Prize Allocation Form prior to commencement of the Tournament. The Team Member Prize & Allocation Form specifies how that Team wants its prizes (if any) allocated amongst the Team Members. Only Team members listed on the Team Member & Prize Allocation Form are eligible to receive a prize (if any). Additionally, prior to the awarding of any Tournament prizes, each Team member entitled to part of the prize will be required to execute a Prize Acceptance Form outlining the amount of the total prize that the Team is entitled to, and portion of the Team prize to which the individual Team member is entitled.

8.3.0. Rule:

Changes During Competition: Rule changes between years can have unforeseen consequences. If a rule is found to cause significant negative impact to the competition, the rules may be adapted under the following conditions:

- Only between phases of the competition
- Only for major problems, as a last resort.
- The change must be approved by all team leaders (by an unanimity vote)

8.4.0. Final Authority: TechnoXian organizer shall have final authority over the interpretation and application of all Rules and decisions regarding the Rules shall be made by TechnoXian in their sole and absolute discretion. Decisions by TechnoXian in regards to the interpretation and application of the Rules, the Tournament and the Program shall be final and not subject to challenge or appeal.

Notice: These Design Rules may change at any time with or without specific notice to you. Any changes made to these rules will be noted in a revised Design Rules document with a higher Rev number. You acknowledge and agree that it is your responsibility to read, understand, and comply with any and all rules provided herein or otherwise by TechnoXian. It is strongly encouraged that you check these Design Rules often for any changes that may affect your design, build, and/or ability to compete in the Tournament. TechnoXian reserves the right to remove any Team from the Tournament at any time for any reason (including, without limitation, failure to meet safety and/or technical requirements) in its sole and absolute discretion.