

ROBO FOOTBALL CHAMPIONSHIP

The Robo Football Championship represents the pinnacle of student innovation, engineering excellence, and competitive spirit in autonomous robotics. This state-level tournament brings together young minds from across the region to design, build, and program autonomous robotic vehicles capable of playing the beautiful game of football. More than just a competition, this championship serves as a platform for students to apply STEM principles in real-world scenarios, fostering creativity, problem-solving skills, and teamwork.

Participants will experience the thrill of competition while developing technical expertise that will serve them throughout their academic and professional careers. This official rulebook establishes the standards, guidelines, and regulations that govern all aspects of the tournament, ensuring fair play, safety, and an exceptional experience for all participants.

1. AGE CATEGORIES & TEAM ELIGIBILITY

Group A: Ages 7–9

Elementary division focused on introducing autonomous vehicle programming and basic soccer strategy for robotic cars.

(22.5×22.5×15)

Group B: Ages 10–14

Middle school division emphasizing intermediate autonomous vehicle programming, mechanical design principles for robotic cars, and advanced soccer tactics.

(20×20×15)

Group C: Ages 15–18

High school division showcasing advanced robotic vehicle engineering, sophisticated autonomous control systems, and complex soccer strategies.

(20×15×12.5)

Age eligibility is determined based on the participant's age on the official event date. This ensures fair competition among peers with similar developmental capabilities and educational backgrounds. Teams with mixed-age participants will automatically compete in the category corresponding to their oldest team member, maintaining competitive balance and fairness across all divisions.

ELIGIBILITY REQUIREMENTS

- All participants must be currently enrolled students or registered club members
- Age verification through official documentation is mandatory during registration
- Teams may represent schools, robotics clubs, or independent organizations
- State residency is required for all team members

PARTICIPATION SCOPE

The championship welcomes diverse participation from across the state, including public schools, private institutions, homeschool cooperatives, community robotics clubs, and independent teams. This inclusive approach ensures that all students with passion for robotics have the opportunity to compete, regardless of their educational setting. We encourage both experienced teams and first-time participants to join this exciting celebration of innovation and engineering.



2. TEAM COMPOSITION & REGISTRATION

I

Form Your Team

Assemble 2-3 students passionate about designing and programming autonomous robotic vehicles for soccer

III

Complete Registration

Submit all required documentation and registration fees through the official online portal

II

Designate a Mentor

Identify one adult coach or mentor (18+) to guide and accompany the team

IV

Prepare Your Robotic Cars

Build and test up to 3 robotic cars, ensuring proper chassis, motors, sensors, and control systems meet technical specifications

TEAM STRUCTURE

Each team must consist of a minimum of 2 students and a maximum of 3 students. This size range ensures that all team members can actively participate in robotic car design, construction, and operation while maintaining manageable team dynamics. One adult mentor or coach aged 18 or older must accompany each team throughout the event. The mentor serves as the primary liaison with event officials and provides guidance to students, though direct intervention during matches is strictly prohibited.

Teams must be self-contained units—sharing robotic cars or drivers between different registered teams is not permitted. This rule preserves competitive integrity and ensures that each team's success reflects their own efforts and ingenuity.

ROBOTIC CAR ALLOCATION

Each team may bring up to three robotic cars to the championship venue: one or two primary robotic cars for active competition and one backup robotic car. This allowance provides teams with contingency options in case of mechanical failures or damage during competition. However, only robotic cars that have passed pre-match inspection may be used during official gameplay.

Teams should prepare their robotic cars with redundancy in mind, ensuring backup systems and spare parts are available for rapid repairs between matches.



3. ROBOTIC CAR TECHNICAL REQUIREMENTS

1

Physical Composition

Robotic cars must adhere to strict physical dimensions: a maximum of 25cm (Length) × 20cm (Breadth) × 15cm (Height). The total weight, including all components such as chassis, wheels, motors, and sensors, must not exceed 1 kg.

2

Power Systems

Battery-powered operation only—approved types include Li-ion, LiPo, NiMH, and dry cell batteries. Voltage must not exceed 9 Volts to ensure electrical safety and prevent damage to arena equipment.

3

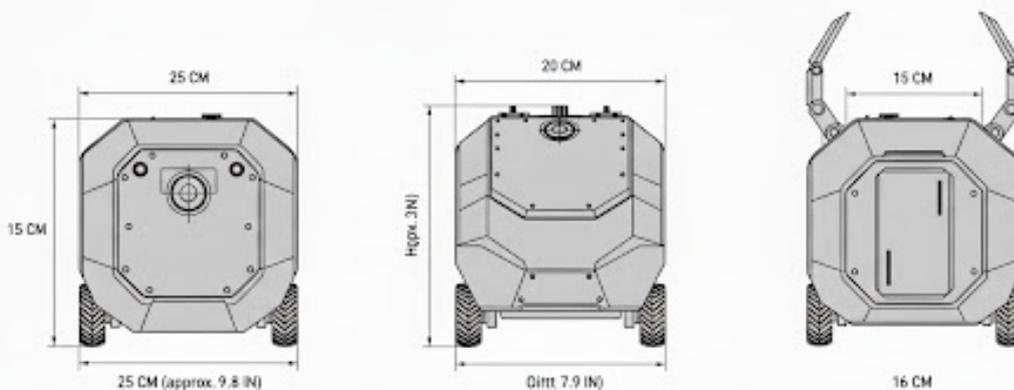
Control Mechanisms

Wireless control systems exclusively—no wired tethers permitted. Emphasis is placed on robust autonomous vehicle control systems and sensor-based navigation for precise ball interaction and movement across the field. Manual remote control is also acceptable for specific competition categories.

4

Safety Compliance

Robotic cars must be designed without sharp edges, exposed rotating parts (like sharp wheels or exposed gears), hazardous substances, or mechanisms designed to damage other cars or the field. All electrical components must be properly insulated and secured.



ORTHOGRAPHIC PROJECTIONS: ROBO SOCCER CAR (UNITS: CM & CM)



PROHIBITED FEATURES & MECHANISMS

Allowed: Teams may design and customize their robotic cars, provided they strictly follow all rules and regulations. The following are allowed:

- a. Custom chassis (wood, plastics, composites, 3D-printed parts).
- b. Standard fasteners (nut, bolt, screws)
- c. Safe adhesives like thread-lockers or double-sided tape can be used inside the robotic car (e.g., to secure wires).
- d. Identification: Each team must leave a 4 × 4 cm space on the top side of their robotic car for official labeling during inspection, clearly visible from above.

Not Allowed: The organizers reserve the right to disqualify any robotic car deemed dangerous at any point in the competition. As follows,

- a. No exposed sharp edges: The entire design of a robotic car must not have sharp edges or pointy structures that may harm the Arena, ball, or other robotic cars around it, especially on wheels or protruding parts.
- b. No hazardous materials: No dangerous, flammable, or harmful substances (fluids, powders, aerosols).
- c. No Anchoring or adhesion: No tethers, suction cups, sticky coatings, electromagnets, or mechanisms that anchor to the floor/walls/ball.
- d. No Destructive mechanisms: No devices intended to damage, wedge, flip, or trap opponents (e.g., saws, spikes, entangling tools, directed heat).
- e. Interference: No infrared, electromagnetic, RF, or Wi-Fi/Bluetooth jamming; only approved Bluetooth/Wi-Fi control is allowed.
- f. Unauthorized radios: No custom transmitters/receivers. Any device intentionally generating RF/IR interference is not allowed. (see Code of Conduct & Fair Play).

Inspector's discretion: If a design is unsafe or against the spirit of fair play, it may be required to modify before approval—even if not explicitly listed above.

Ball-Handling Mechanism Rules:

Coverage: From any viewpoint, the robotic car's ball-handling mechanism must not cover > 50% of the ball's circumference, preventing it from being held captive.

No Grabbing or Trapping: The ball must remain free to roll away when lightly pushed by an official—no full enclosures, pincers, or trapping mechanisms designed to hold the ball in place. Mechanisms should facilitate pushing or kicking, not possession.

Clearance: Your robotic car's ball-handling mechanism must provide a minimum \geq 16 cm of open space where the ball interacts with the car. This ensures the ball can always roll out and is not trapped.



Example:

a. Legal: Designs that gently push or kick the ball, allowing it to easily roll free.

b. Illegal: Any design that traps, squeezes, or uses adhesive to prevent the ball from rolling out freely.

Safety Reliability:

Mechanical: All screws and parts on the robotic car must be tight. Cover moving parts like belts, gears, and drive shafts. Round off sharp edges. Robotic cars should not drop pieces on the field during play.

Electrical: Cover battery terminals. Keep wires neat and tied. Use strain relief on high-power cables.

Batteries: Only safe batteries allowed—no swelling, leaking, or damaged packs. Referees can remove unsafe batteries.

Weight and Size: Robotic cars must always meet size and weight rules, even after paint, tape, or repairs. They can be checked again anytime.

Connectivity and Control

Robotic cars must pair and demonstrate basic manual control (forward/turn/stop) using PictoBlox or **Dabble at inspection.**

Each robotic car must use its own control link. Non-essential radios must remain OFF near the field.

To prevent interference, teams should set a unique device name/channel and follow any RF channel assignment given by officials.

USB cables for charging or connectivity can be used only in the pit area, not on the match field.

Inspection Rules:

Only robotic cars with a passed inspection tag can enter the field.

Any change to chassis, wheels, controller, battery, or ball-handling mechanism requires re-inspection.

If a team declares multiple robotic cars, each one must pass inspection separately.

Referees may re-check size, weight, and voltage anytime during matches.

Good Practice:

Design slightly smaller (≤ 24.5 cm, ≤ 950 g) for safety margin.

Mark the front of your robotic car clearly for easier driving.

Keep wiring neat and secure.

Carry spare batteries or Bluetooth modules.



4. ARENA SPECIFICATIONS & ENVIRONMENT FOR ROBOTIC CAR SOCCER

Playing Field Design for Robotic Vehicles

- 4.1.1. Arena Area: 8 ft × 4 ft
 - 4.1.2. Playing Area: 6 ft × 3.6 ft
 - 4.1.3. Boundary Wall: 10-15cm high, with slightly filleted corners.
 - 4.1.4. Goal Post: Width- 40cm, Height-25cm, Depth- 20cm
 - 4.1.5. Surface: Flat, matte printed wooden board with high-contrast white markings;
- low-glare finish to aid robotic vision sensors.

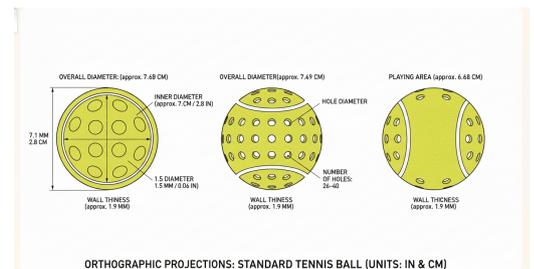


ORTHOGRAPHIC PROJECTIONS: ROBO SOCCER FIELD (UNITS: FT-IN & CM)

Game Ball Standards for Robotic Soccer

The official game ball used throughout the championship is standardized in both size and material composition, specifically chosen for robotic car soccer. The ball's weight, diameter, surface texture, and rebound characteristics are carefully controlled to ensure consistent behavior during gameplay by robotic vehicles.

Teams should design their robotic cars' ball-handling mechanisms with these specific ball properties in mind. Practice balls matching official specifications are typically available for purchase through the organizing committee or recommended vendors, allowing teams to test and refine their designs before competition day.



ORTHOGRAPHIC PROJECTIONS: STANDARD TENNIS BALL (UNITS: IN & CM)



Precise Dimensions

Standardized field size ensures fair play for all robotic vehicles across all matches.



Clear Markings

Professional field markings guide robotic car gameplay and strategy.

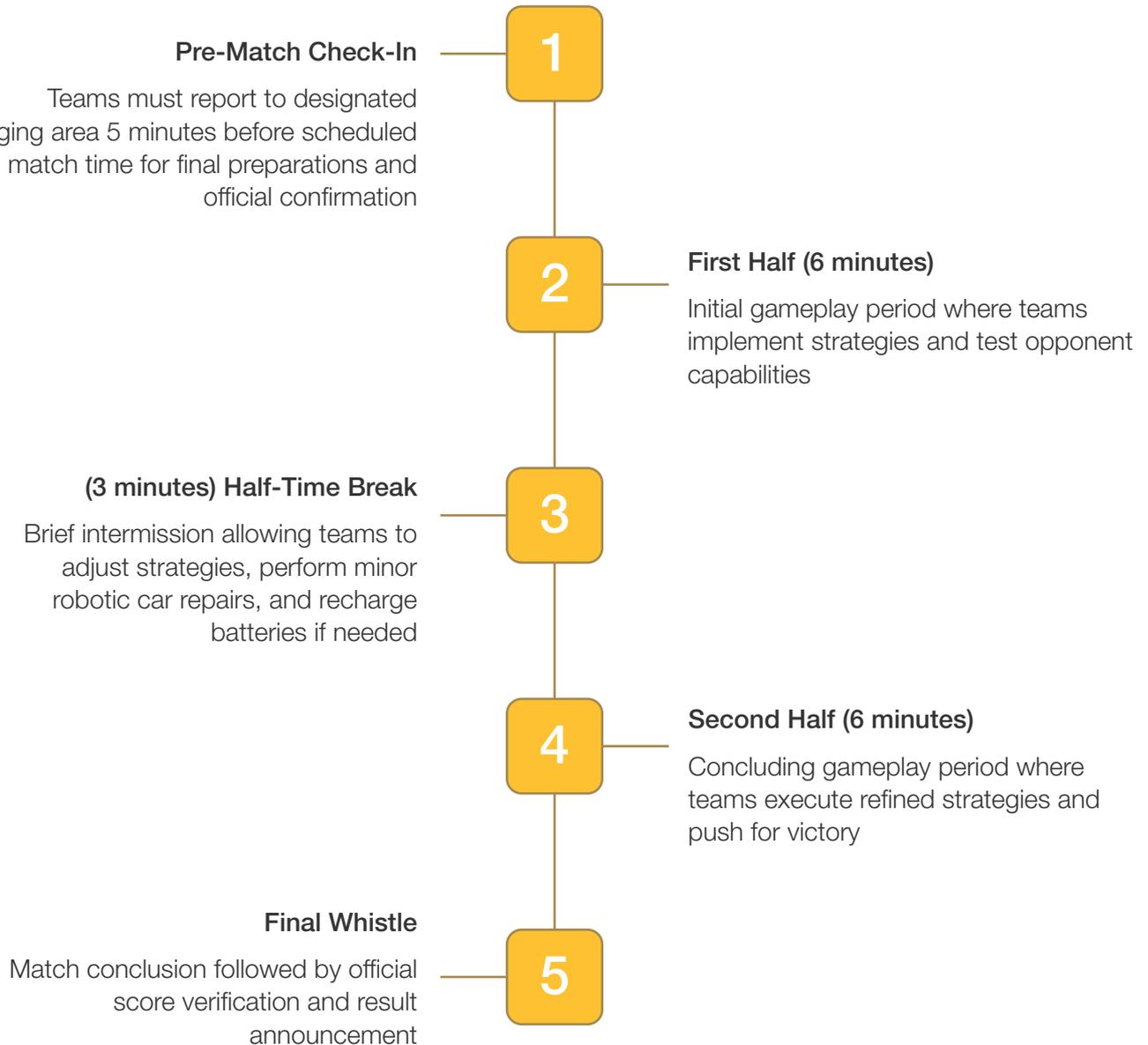


Official Goals

Regulation goal sizes challenge the precision and accuracy of robotic cars.



MATCH FORMAT & GAME TIMING



Competition Structure

Each match pits two teams against each other in head-to-head competition, with robotic cars from both teams simultaneously attempting to score goals while defending



FOULS, PENALTIES & CODE OF CONDUCT (- 4 POINTS FOR EVERY FOUL)

False Start

Robotic car moves before official match start signal-results in warning or point deduction depending on severity and advantage gained.

Illegal Contact

Excessive ramming, aggressive driving tactics, pinning, or deliberately damaging an opponent's robotic car-penalties escalate from warnings to potential disqualification.

Human Interference

Touching robotic car or ball during active play, or mentor providing real-time instructions-immediate point deduction or match forfeit.

Ball Trapping

A robotic car possessing the ball for more than 5 consecutive seconds without attempting advancement, or holding the ball in a manner that prevents fair play-referee intervention and possible penalty.

Goal Camping

Remaining stationary in defensive zone without active ball pursuit will be followed by points deduction and penalties for repeated violations.

Arena Interference

Damaging field surface, goals, or equipment-team responsible for repairs and potential disqualification from tournament.

PENALTY ESCALATION SYSTEM

The championship employs a graduated penalty system to address rule violations while maintaining competitive fairness. Minor infractions typically result in verbal warnings for first occurrences, allowing teams to correct behavior without significant consequence. Repeated violations or more serious infractions may lead to point deductions from the team's match score, yellow cards indicating official warnings that remain on record, or red cards resulting in immediate robotic car removal from the current match.

Severe misconduct—including intentional damage to opponent equipment, abusive behavior toward officials or other participants, cheating, tampering with opponent robotic cars, or sabotage—may result in immediate team disqualification from the entire tournament. The organizing committee and head officials have final authority on disqualification decisions, which are made with careful consideration of all circumstances and evidence.

EXPECTED BEHAVIOR STANDARDS

All participants, coaches, mentors, and spectators associated with teams must demonstrate respectful, sportsmanlike conduct throughout the championship. This includes treating opponents, officials, volunteers, and fellow participants with courtesy and dignity, accepting referee decisions gracefully even when disappointed, and refraining from any abusive language, aggressive behavior, or unsportsmanlike tactics.

During active matches, only the designated team captain may communicate with referees regarding rule clarifications or addressing concerns. All other team members should remain focused on robotic car operation and strategy execution. Coaches and mentors may guide their teams during preparation periods and breaks but must not interfere during gameplay. This structure maintains proper chain of communication and prevents chaos that could disrupt tournament proceedings.



SAFETY, AUTHORITY & CLOSING GUIDELINES

Pre-Match Inspection

All robotic cars must pass a comprehensive safety inspection before each match. This includes thorough checks of wheels, motors, sensors, and chassis integrity. Unsafe designs—such as sharp edges, exposed wiring, overheated components, or unstable batteries—will be rejected until corrected.

Battery Safety

Teams must follow proper battery charging, storage, and handling procedures. Only use approved charging equipment in designated areas. Never leave batteries charging unattended.

Field Access Control

Only participants and authorized officials may approach the playing field during active matches. Spectators, parents, and non-competing team members must remain in designated viewing areas.

REFEREE AUTHORITY

Referees possess absolute authority over match conduct and rule enforcement. Their real-time decisions during gameplay are final and binding—teams may not dispute calls during active play. However, teams may submit formal clarification requests or challenge significant procedural errors within 10 minutes following match conclusion.

These post-match inquiries must be submitted in writing through the team captain to the head official or tournament director. Challenges must address clear rule violations or procedural errors, not subjective referee judgment calls. The organizing committee will review all properly submitted challenges and issue decisions promptly, though match results typically stand unless compelling evidence of significant error exists.

CHAMPIONSHIP SPIRIT

The Robo Soccer Championship celebrates innovation, learning, and the incredible potential of young engineers and roboticists as they design and build autonomous vehicles. While competition naturally generates intensity and desire for victory, the true measure of success extends beyond trophies and rankings. Teams that demonstrate exceptional sportsmanship, creative problem-solving, elegant design solutions, and gracious professionalism toward competitors embody the championship's core values.

We encourage all participants to view this event as an opportunity for growth, skill development, and building lasting connections with fellow robotics enthusiasts. Ask questions, share insights, learn from setbacks, celebrate both your victories and your opponents' successes, and carry the knowledge gained here forward into future projects and competitions. The friendships formed and lessons learned at this championship often prove more valuable than any single match outcome.

Welcome to the Robo Soccer Championship—where creativity meets competition, and young engineers drive the future of autonomous vehicles!

ORGANIZATIONAL DISCRETION

Tournament organizers reserve the right to modify rules, adjust schedules, merge age categories with insufficient participation, or make other operational decisions necessary to ensure fair competition, participant safety, and successful event execution. All rule updates or modifications will be communicated to registered teams as quickly as possible through official channels.

The organizing committee accepts no responsibility or liability for loss, theft, or damage to personal equipment, robots, or belongings brought to the championship venue. Teams should take appropriate precautions to secure their property and consider insurance coverage for valuable custom-built robots.

