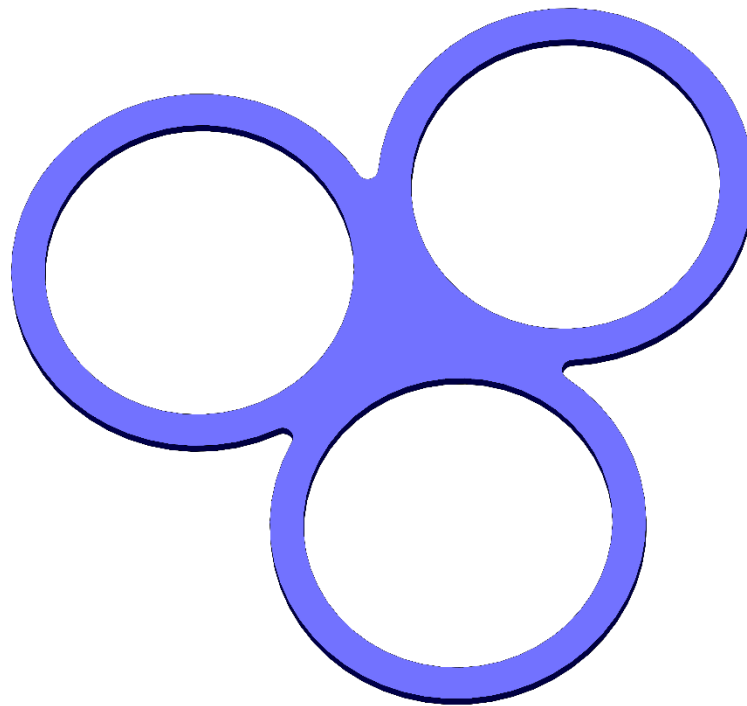


Bloomington Robotics Club
&
Ivy Tech Community College

10th Annual Robotics Tournament



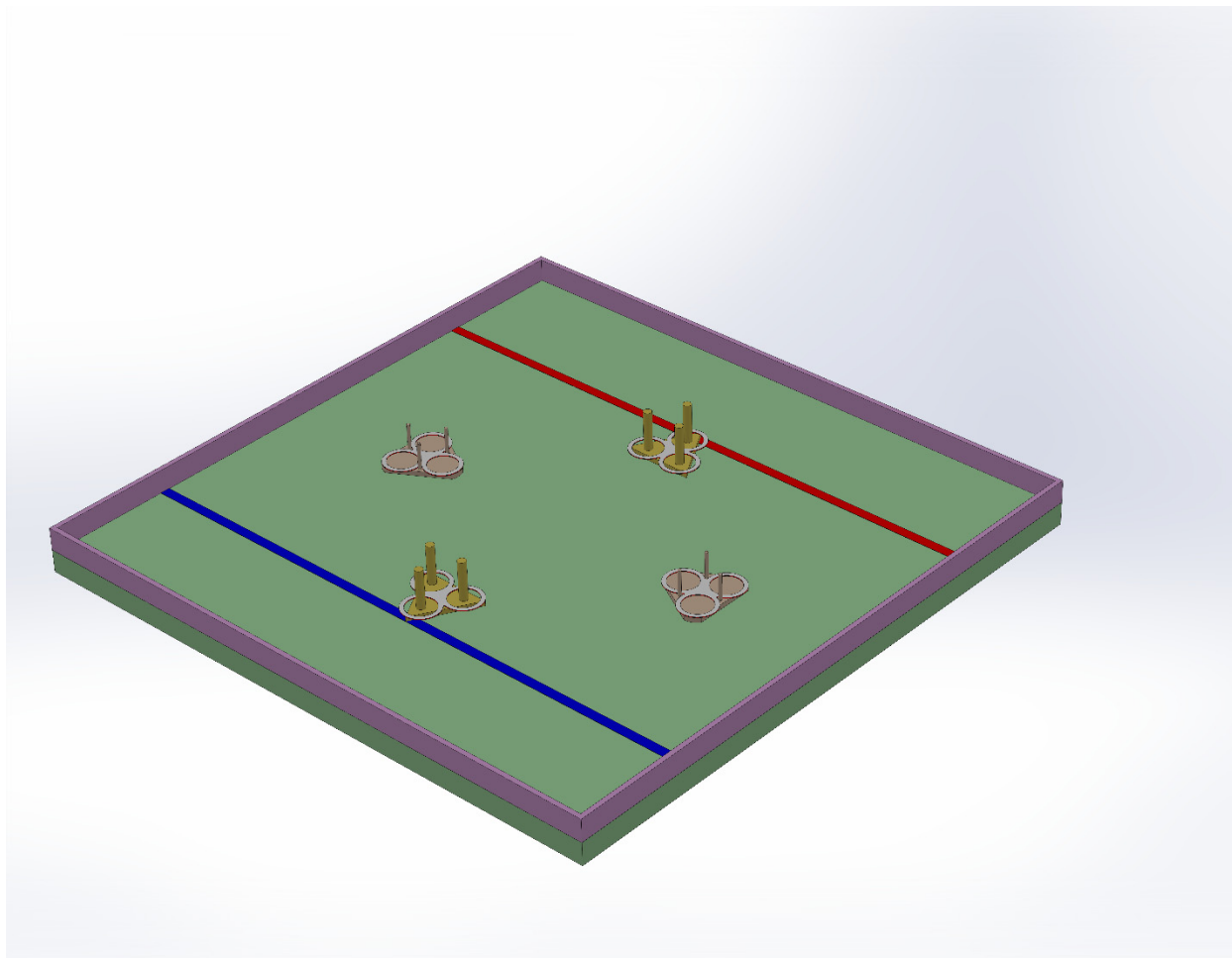
Triad

Official Rules

November 7, 2015

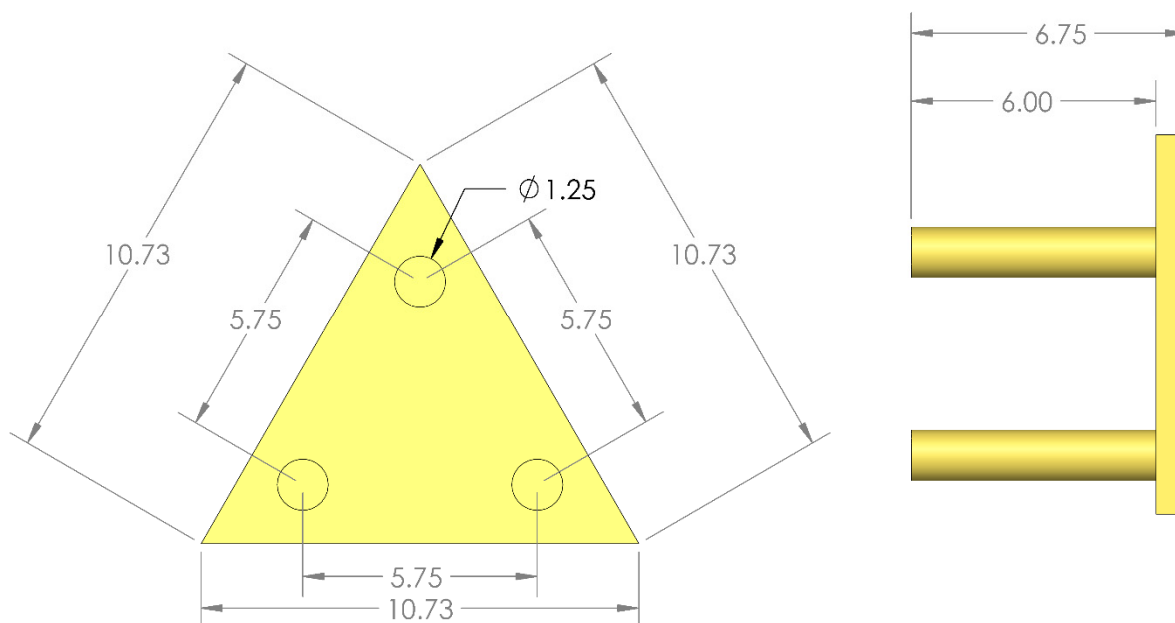
The Field

The field is 8'x8' square and covered with commercial-grade low pile carpet. It will be placed on two 8' tables elevating the field to approximately 34" from the floor for player access. The field is surrounded by rails 3.5" high.



Goals

There are two (2) goals on the table. One for the RED alliance and one for the BLUE alliance 18" in from the end and 48" over from the side rail directly in front of the robot starting area and are screwed to the table surface.

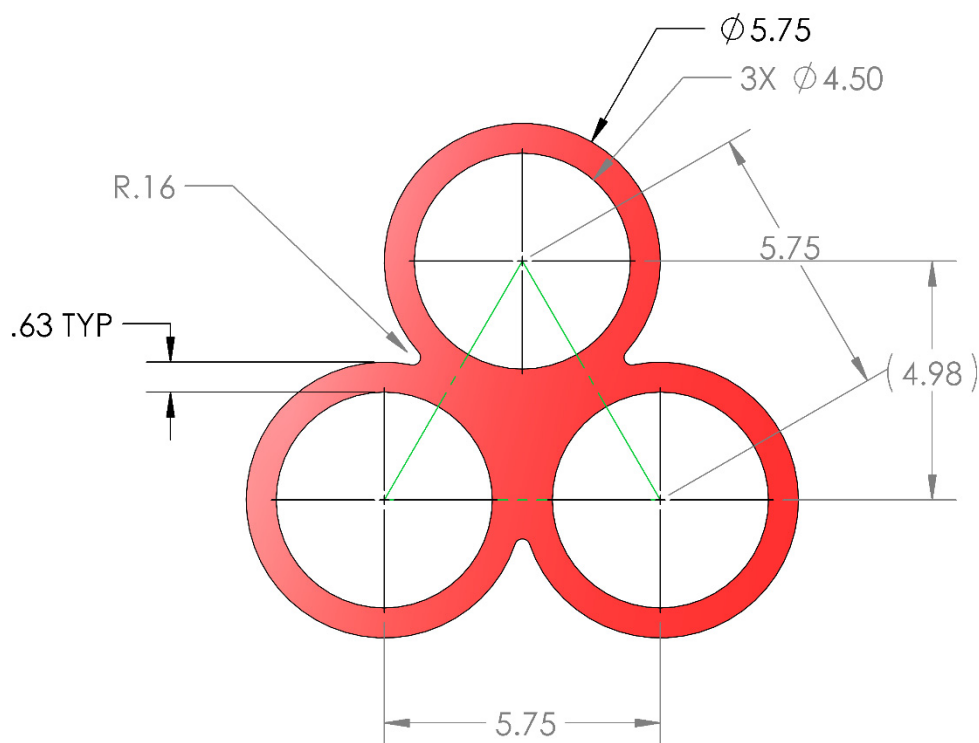


Goal picture

TRIADS (Scoring Elements)

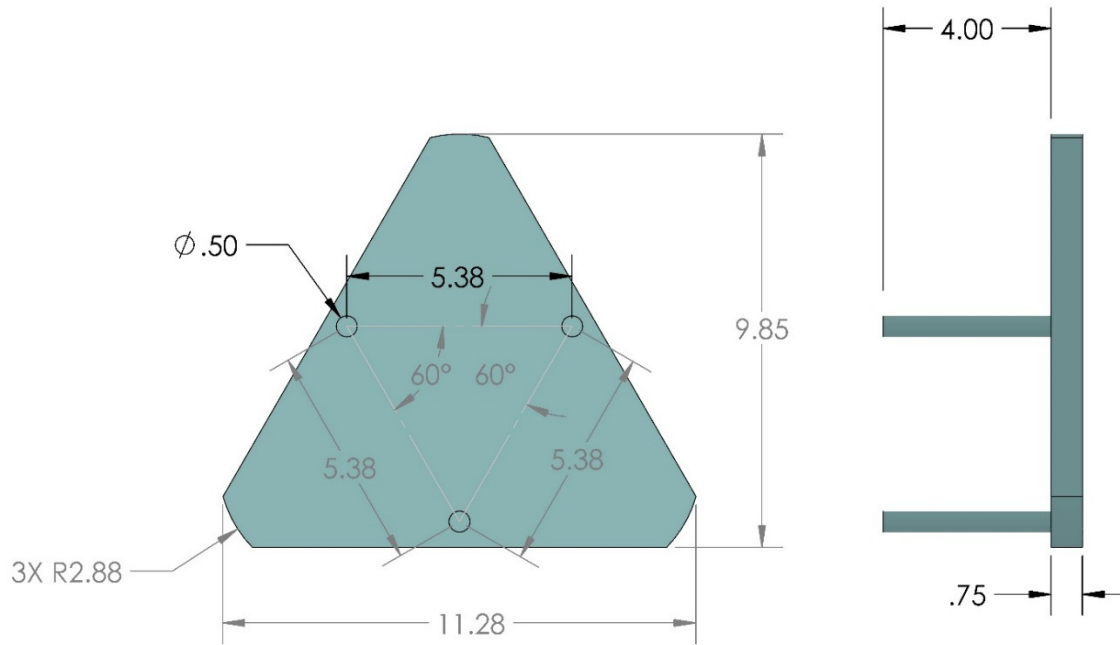
TRIADS will be used as the scoring elements. There are a total of 28 TRIADS available as scoring elements in the game. There will be 24 white TRIADS and one RED and one BLUE TRIAD. An additional white TRIAD can be preloaded in the robot at the start of the autonomous period. (see field drawing).

TRIADS are made from 1/8" acrylic plastic. Practice TRIADS can be made from cardboard, 1/8" plywood, or other materials.

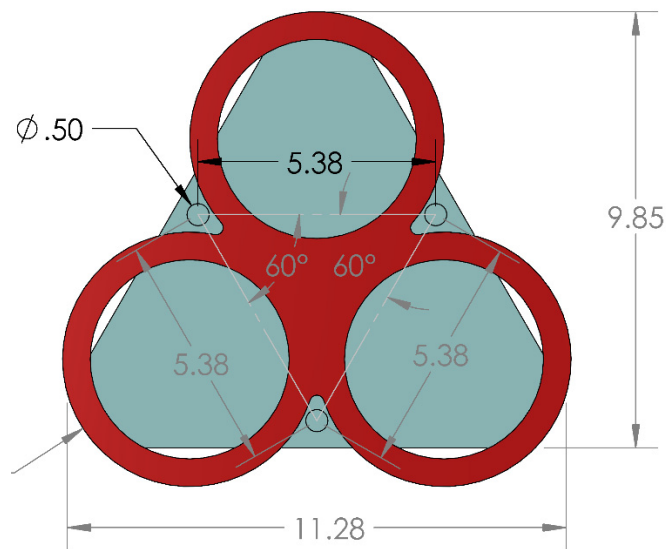


TRIAD Racks

TRIADS will be placed on a rack at the beginning of each match. The racks will have three (3) four inch (4") high, $\frac{1}{2}$ " diameter dowels secured in a wooden base. Each rack will have 12 white TRIADS and either a red or blue TRIAD on top of the rack. The base of the rack will be screwed to the table 18" in from the edge rail and centered on the table.. (see drawing below and field table drawing)



RACK picture



RACK with TRIAD

The Robot

1. Only ONE robot will be allowed to compete per team.
2. Only one driver/controller operator is allowed.
3. Any robot kit can be used as long as it follows the guidelines listed below.
4. Parts can be manufactured out of any available materials.
5. Robots overall size can be no more than 15"x 15" x 18". Bots may expand beyond the starting size once the match has started.
6. Robot chassis will remain on the playing field. Robot driving is limited to the playing field.
7. Robots cannot place any of its parts or a stationary object in front of a goal in an attempt to block the opening of the scoring goal.
8. Every robot will be required to pass an inspection before being cleared to compete. This inspection will ensure that all robot rules and regulations are met. Initial inspections will take place at each field by the field referee before the competition begins. During inspections, robots may be placed into a "sizing box" which has interior dimensions that reflect the above size constraints. To pass inspection, a robot must fit within the box without exerting ANY force on the box walls or ceiling.
9. Robots may constructed out of any available parts and accessories. The completed robot may only use (1) 7.2-volt battery to power the robot.
10. A single robot may not use more than five (5) continuous rotation motors or servos in any combination.
11. Robots may not intentionally detach parts during the match or be design to entangle, destroy, or damage other robots or the playing field.
12. Reprogramming of the microcontroller is allowed.
13. Make sure that your receiver (yellow box) is easily accessible to crystals.

The Game

All team members, including coaches, must wear safety glasses or glasses while in the pit or alliance stations during matches.

Matches are played on a field initially set up as illustrated in the figures above. Two alliances – one **RED** and one **BLUE** – composed of two teams each, compete in each match. **The object of the game is to attain a higher score than your opponent alliance by getting TRIADS on the goal.**

Scoring

Points are achieved by collecting the TRIADS and placing the TRIADS on your alliance's goal. Scores will be calculated for all matches either immediately after the match or when all objects on the field come to rest. The contents of each goal will be tallied and recorded on the official scoring sheet by the field judge(s) and the winning alliance will be announced. The score is calculated by the number of TRIAD rings on the goal posts.

Autonomous Period (30 seconds)

There is a 30-second autonomous period at the beginning of each match. During this time the robot will operate only via an on-board program. This portion of the match is optional and teams may choose to not program the robot for this portion of the contest.

The robot may be preloaded with one additional white TRIAD before the beginning of the start of the match.

Autonomous Points will be awarded for each TRIAD scored during the autonomous portion at the normal game amount.

Radio Controlled (2 minutes)

Each team will need to move the TRIADS from the storage rack to the goals. **Red** alliance will put TRIADS on the **RED** goal and the **Blue** Alliance will score by placing TRIADS on the **BLUE** goal.

Any TRIAD on the field is in play and may be used by any available robot. TRIADS cannot be de-scored or removed from the GOALS after scoring.

At the end of the 2-1/2 minute match an alliance's points will be recorded by totaling the points scored.

WHITE TRIAD (1 point/ring)

1 ring over a post = 1 point

2 rings over 2 posts = 2 points

3 rings over 3 posts = 3 points

RED TRIAD on RED Goal (2 points/ring)

1 ring over a post = 2 points

2 rings over 2 posts = 4 points

3 rings over 3 posts = 6 points

RED TRIAD on BLUE Goal

- 1 ring over a post = -5 points blue
- 2 rings over 2 posts = -10 points blue
- 3 rings over 3 posts = -15 points blue

BLUE TRIAD on BLUE Goal (2 points/ring)

- 1 ring over a post = 2 point
- 2 rings over 2 posts = 4 points
- 3 rings over 3 posts = 6 points

BLUE TRIAD on RED Goal

- 1 ring over a post = -5 points red
- 2 rings over 2 posts = -10 points red
- 3 rings over 3 posts = -15 points red

Match Sequence

1. When it is your team's time to compete, obtain a crystal set from the field referee and place them in your robot and transmitter.
2. Position your robot in its starting position and configuration in the red or blue starting box.
3. Matches are 2-1/2 minutes in length. The first 30 seconds is autonomous. The next 2 minutes are radio-controlled. All scores will be tallied once time expires. The winner of the match will then be announced.
4. Return both crystals to the field referee before leaving the field area.

When Competing

1. All team members, including coaches, must wear safety glasses or glasses with side shields while in the pit or driver stations during matches.
2. Drivers and spectators are prohibited from making intentional contact with any game components or robots. The first instance of intentional contact will result in a disqualification.
3. During a match, the drivers must remain within the Driver/Coach area as shown on the field layout.
4. There may be only driver for each match. If anyone other than the assigned driver touches his/her team's controls anytime during the match, the robot will be disabled and the team disqualified.
5. If a robot or scoring component leaves play during the match it will not be allowed to be reintroduced.
6. If a robot becomes stuck or disabled on a field component or another robot, or if a team's power fails during a match, no interventions will be taken. The robot will

remain in position until the match ends. Only if a field element fails or a referee-determined entanglement happens will a match be stopped.

7. Blocking an opponents' goal is not in the spirit of *Triad*. All teams should be actively trying to score TRIADS through the goal. ***Triad is a scoring game.*** Your team cannot win if you don't score points.
8. All TRIADS are in play. Any TRIAD can be used as a scoring element.
9. Pinning is not allowed. And direct robot contact for more than a 5 count is considered pinning (even in the middle of the field). This first offense is a warning. Any further instances will result a disqualification for that match.
10. If at any time the robot operation is deemed unsafe or has damaged the playing field or components, the referees will stop the match and the offending team's robot will be removed for the remainder of the match.
11. *Triad* is a highly interactive game. Some contact, tipping, entanglement, and damage may occur as a part of normal game play. If the tipping, entanglement, or damage is ruled to be intentional, the offending team may be disqualified. Entangled robots will be given a "10-count" by the field referee and be allowed to manually detangle by the team coaches or referee. In extreme circumstances, play may be stopped and the match replayed.
12. In case of field failure, the match will be replayed.

When Not Competing

- All robots operating with crystals must be tethered while not competing.
- Any team with an operating remote control that is with transmission crystal and not tethered will be disqualified.

Competition Structure

Triad will be played in a tournament format. Each tournament will include *practice*, *qualifying*, and *elimination matches*. After the *qualifying matches*, teams will be ranked based on their performance. The top teams will then participate in the *elimination matches* to determine the tournament champions.

Alliance Captain – A student chosen to represent their team during *Alliance Selection* for the final *Elimination Matches*.

Alliance Selection – The process of choosing the permanent alliances for the *Elimination Matches*.

Crystal Assignment – The designated radio frequency crystal that a team will use for a given match. These crystals will be provided to teams before each match.

Elimination Match – A match used to determine the championship alliance. Alliances of three face off in a best two of three series, with two teams playing in each match. The first alliance to win two matches will proceed to the next round.

Practice Match – An un-scored match used to provide time for teams to get acquainted to the official playing field.

Qualifying Match – A match used to determine the rankings for the *Alliance Selection*. Alliances compete to earn *Qualifying Points* and *Ranking Points*.

Qualifying Points (QPs) – The first basis of ranking teams. *Qualifying Points* are awarded for winning (two points) and tying (one point) a *Qualifying Match*.

Ranking Points (RPs) – The second basis of ranking teams. *Ranking points* are awarded in the amount of the score of the losing alliance in a *Qualifying Match*.

At the event *Practice matches* will be played in the morning during the team registration time until the announcement and inspections begin. Every effort will be made to equalize practice time for all teams, but will be conducted on a first-come, first-served basis. These matches are not scored, and will not affect team ranking.

- The *qualifying match* schedule will be available after the opening ceremonies on the day of competition. This schedule will indicate alliance partners and match pairings. It will also indicate the alliance's color – red or blue – and your team's starting position for each match.
- The *qualifying matches* will start immediately after opening ceremonies in accordance with the qualifying match schedule.
- Teams will be randomly assigned an alliance partner to compete against two randomly assigned opponents in each *qualifying match*.
- All teams will be **scored** on the same number of *qualifying matches*.
- In some cases, a team will be asked to play in an additional *qualifying match*, but will not receive credit for playing this extra match.

At the conclusion of each match, *Qualifying Points (QP)* will be issued:

- Winning teams of a *qualifying match* receive two (2) *QP*
- Losing teams of a *qualifying match* receive zero (0) *QP*
- If a *qualifying match* ends in a tie, all four teams receive one (1) *QP*
- If a team is disqualified they receive zero (0) *QP*
- All teams in each *Qualifying Match* will also receive *Ranking Points (RP)*.
 - **The number of ranking points assigned for each match, is that of the losing alliance's score.**
- In the event of a tie, both alliances will receive the same *RP* (equal to the tie score).
- If a team is disqualified they receive zero (0) *RP*
- If both teams on an alliance are disqualified, the teams on the winning Alliance will be awarded their own score as their *RP* for that match.
- **For a *qualifying match*, if no member of a team is present in the driver station at the start of a match, that team is declared a "no show" and will receive zero (0) *QP* and zero (0) *RP*.**

Tournament Rankings & Tie Breakers

- Teams will be ranked on the basis of the sum of their *Qualifying Points (QPs)*

If multiple teams have the same *QP Total*

- Teams will be sorted on the basis of the sum of their Ranking Points (RPs)

If multiple teams have the same RP Total

- Teams will be sorted on the basis of their highest match score. If still tied, the next highest match score will be used until the tie is broken

If multiple teams have identical match scores

- Teams will be sorted by a random electronic draw

Elimination Matches

The *alliance selection* process will consist of two rounds of selection, such that eight alliance captains will form elimination alliances consisting of three teams.

These eight alliances will participate in a tournament to determine the event champions.

If a team is disqualified during an *elimination match*, then their entire alliance is disqualified, and the match will be recorded as a loss.

Alliance Selection Process

1. Every team will choose a student to act as a team representative.
2. These student representatives will proceed to the playing field at the designated time to represent their teams in the *alliance selection*.
3. There will be eight alliances formed in the *alliance selection*.
4. In order of tournament ranking, the student representative of the highest ranked team not already in an alliance will be asked to step forward as an *alliance captain* to invite another available team to join their alliance.
5. A team is available if they are not already part of an alliance, or have not already declined an alliance invitation.
6. If the team accepts, it is moved into that alliance.
7. If a team declines an invitation, they CANNOT be invited into another alliance, but are still available to select their own alliance if the opportunity arises.
8. If a team declines, the *alliance captain* from the inviting team must then extend another invitation.
9. This process will continue until all eight *alliance captains* have been designated and chosen one alliance partner.

The same method is used for each *alliance captain's* second choice. Any teams remaining after alliance eight makes their second choice will not compete in the *Elimination Matches*.

During matches, two teams from an alliance will play on the field. **Any team which sits out the first match in elimination series must play in the second match, with no exceptions.**

Teams should consider the robustness of the robots when picking alliance partners.

Prior to each *elimination match*, the *alliance captain* must let the referee know which two teams will play in the upcoming match

Match Ladder

The *elimination matches* will play in a ladder format as shown.

Elimination Scoring

In the elimination rounds, teams do not get *qualifying points*; they get a win, loss or tie. Within each bracket of the Elimination Match Ladder, matches will be played to determine which alliance advances, as follows:

The first alliance to win two matches advances.

Any tied matches will be replayed until one alliance has two wins, and advances.

