TEAM 972: IRON CLAW ROBOTICS

Official Team Handbook



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An electronic version of this handbook is at: https://handbook.ironclaw972.org/

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Program Overview

Introduction

This handbook is intended to be a comprehensive document for team members, families, the FIRST community, and the public in general of how Team 972, Iron Claw, operates. It is intended to be as comprehensive as possible in regards to all our team policies and procedures, and enable transparency for all members to understand how we operate. This handbook is an open source document, and we welcome all people to view this and freely use any ideas presented herein as they see fit. Welcome!

About Us

Team 972 is a *class* and a *team* at Los Gatos High School (LGHS) that is composed of LGHS students, adult mentors in the community, and school faculty. The team is focused on learning the aspects of functioning as a team, learning robotic engineering, and competing in the *FIRST* Robotics Competition. Each year the team has 6 to 9 weeks to design and build a 120 lb robot to compete in the yearly FIRST, FRC competition. In the process of designing, manufacturing, assembling, and testing a robot for competition, members of Team 972 learn and develop a wide variety of skills which will serve them for years to come. These include, but are not limited to: technical skills (programming, manufacturing, CAD, and electrical), business skills (fundraising, marketing, budgeting, and logistics), and life skills (teamwork, leadership, communication, and project management).

The robotics year has three distinct windows during the school year: 1. Fall semester, when students focus on learning new tool skills and safety; 2. Build season (end of Holiday break to the beginning of Winter break in February), when students design, manufacture, assemble, test, and then field a robot for competition; and 3. Post-season, when students document lessons learned and plan for the next season.

Team 972 is fully owned and ran by Los Gatos High School, of which, the teachers are the direct representatives of the school, and they create procedures and policies that align with the school's mission. Los Gatos High School's mission is to *"optimize the learning of each student; promote lifelong learning; social responsibility; and positive physical and mental health"*. This team handbook was created by the school to specify how the team will operate. Los Gatos High School has absolute authority to modify the team (and this handbook) at any time, and in any way it sees fit to satisfy and promote its educational, health related goals.

Given that LGHS desires to optimize learning, a lot of the tasks this team does are fully in the domain of the student; having adults or the school perform these tasks reduces the educational potential. For more details on this, please see our Domains of Jurisdiction section.

Iron Claw Mission Statement

- Participate in the FIRST Robotics Competition by fielding a competitive robot.
 - Note: the school's mission does not include all of FIRST's missions, goals, priorities or any other expectations that it may put on teams.
- Enhance team members' wisdom in regards to work/life/team dynamics.

- Foster and grow skills necessary to work in a team such as listening, negotiating, compromising, public speaking, team cohesiveness, collaboration, communication, leadership, and followship.
- Create lifelong individual learners that possess:
 - Metacognition: know what you know, know what you don't know, know when to teach, and know when to listen and learn.
 - Soft skills such as critical thinking, problem solving, perseverance, creativity, and possessing a growth mindset.
- Help and support others to learn and be successful.
- Enhance team members' knowledge in regards to STEM
 - Learn, practice, and master technical aspects of robotics and engineering.
 - Build the best robot that our team can build, strategize our path to success, and achieve the best result we can.
- Create a team that is as student-led as possible. Anything that can be done well and safely by students should be done by students.
- Have serious fun with robotics and technology.

School Team Goals

The school and student team may craft different goals that, while different, are not mutually exclusive, but work together and complement each other. For example, the student's goals may be to achieve a particular result in a competition, whereas that is not one of the school's goals. The students may craft any goals they desire for the team, but the school's goals are paramount and the student's goals may not supersede the school's goals.

The school's goals for Team Iron Claw are:

- Have students design, manufacture, build, test, and compete their own robot. Ensure that the robot and competition is in the complete domain of students.
- Ensure that students learn and honor wisdom and knowledge of more experienced members of the community. These are the team's "mentors"
- Students participate in running as many aspects of running a robotics organization as much as possible. Anything that can be safely and properly done by students, can and should be done by students. Beyond building and designing a robot, this includes, but is not limited to, fundraising, administration, finance, communications, and networking. Appropriate leads will be incorporated to run those areas.
- Provide a fair team where all students have an opportunity to excel and apply for higher team positions. Ensure, as much as possible, that there is equal access to all educational and learning opportunities.
- Create a safe space of mutual respect where ALL students can learn and interact. (Please see our diversity and inclusion clause for more details on this).
- Ensure there is parity and equity in team jobs and work. Ensure all students have reasonable tasks to do and complete.
- Ensure that students are learning (and committing to memory) specific robotics/engineering knowledge, where this information can competently be represented either orally, written, or in a performance based fashion.



About FIRST & FRC

FRC is the FIRST Robotics Competition. FIRST (For Inspiration and Recognition of Science and Technology) is an international organization that creates a new game for competition each year. Each year, more than 3000 teams from 39 countries compete in the new game at FRC events around the world. See firstinspires.org to learn more.

How to Join the Team

Iron Claw Robotics is a *class* and a *team* at Los Gatos High School. Currently we have a 50-student limit on team size. There are many reasons for this that deserve longer explanations but here are a few of the most salient reasons for this:

- Our facilities can only accommodate that size. We cannot physically fit more students into our work spaces.
- We generally do not have enough adult supervision (mentors and parent volunteers) to accommodate more students. There are only two full time teachers, and various mentors that attend at their disposal.
- We, as of yet, have not found a way to engage more than 50 students on only one team that builds one robot.
- We cannot scale up given that we are only one team, with one robot, and a limited set of jobs.

These are all problems the school is working to resolve. As a school, our goal is to never deny learning or engagement opportunities to students at all costs, but sometimes students need to be turned away because we've hit our limit or we cannot scale up or grow the program in a reasonable way.

Steps to Join

- 1. In order for students to show their intention of wanting to join the team, all they need to do is *register for the Robotics class during course registrations*. This will put them on the application list.
- In April the robotics teachers will start the application process for the following year and applicants will be contacted by the teacher. The application process is two steps:
 - A mandatory meeting will be held with students and parents. *Parents are required to attend.* Here an application form and survey will be filled out by students. In the survey students are quizzed on some of the following basic questions: What is FRC? Why does this team exists? What is the goal of the team? Why do they want to join this team? Do they know the nature of this team?
 - 2. Applicants will need to get an adult reference regarding their prior performance. Students will provide the contact information of the reference at the initial meeting. This can be a previous teacher. Ideally a teacher in a STEM field: science, technology, engineering, or math. Previous FIRST coaches are also good.

Students will be contacted by mid May if they have been accepted into the team.

This is a relatively serious team with in-depth time commitment. *Please see our FAQ in the Appendix regarding the team*, or for a comprehensive overview, review this Team Handbook that has nearly all our operating procedures.

List of Events

Team 972 will participate in several events throughout the school year. These include a pre-season competition, at least two regular season competitions, a "World Championship" competition (if qualified) as well as several robot demonstrations and fundraising events. Note that dates and locations of certain events will be provided to your student in class.

Event Description	Tentative Event Schedule
Preseason Competition	Chezy Champs at Bellarmine - Fall Semester. CalGames at Woodside High School - Fall Semester.
First Regional FRC Competition	Typically during the month of March or April
Second Regional FRC Competition	Typically during the month of March or April
Third Regional FRC Competition	Typically during the month of March or April
FIRST Championship - Houston	Should the team qualify at one of the Regionals
Robot Demonstrations at sponsor organizations	Intuitive Surgical, NMF events, Kiwanis Club, Rotary International San Jose/Los Gatos area - dates various.
Robot demonstrations at local elementary and middle schools	Blossom Hill Elementary, Van Meter Elementary, Daves Elementary, Lexington Elementary, Fisher Middle, Loma Prieta Elementary, C.T. English Middle School - dates various.
Robot demonstrations and workshops at volunteer events -	Sunday Friends and Shining Stars Foundation - San Jose/Los Gatos area - dates various.
Robot demonstrations at fundraising events	Los Gatos Winter Parade - December. Rotary Club Los Gatos, Kiwanis.
Build-a-bot fund-raising campaign	Los Gatos neighborhoods - dates various.
Robot demonstration at Maker Faire Bay Area	San Mateo Event Center, San Mateo, CA - 2020 Dates not yet available.

The school requires a field trip activity form to be filled out to attend all these events. Student attendance at these events is optional with the exception of the local regional competitions. Generally, students participate in one or more additional events depending upon their interest and availability.



Students will be provided transportation and, depending upon the size of the event, one or more adult registered mentors will be present at all times. More details will be provided in class.

Team 972 Structure

Team Leadership

Team 972 is managed by a leadership team and a curriculum council that comprises of student leaders, appointed adult mentors, and school faculty advisors. The leadership team's duties go beyond those of regular members. This team makes administrative decisions, plans events, and manages projects. Every member of the leadership team puts in hundreds of hours of work behind the scenes to ensure that the team operates smoothly.

Curriculum Council (updated yearly by the Robotics Teachers) Teachers

- Robotics Teacher Rodrigo Coppelli
- Robotics Teacher Kerry Northern
- Industrial Technology Teacher Aaron Payne

Student Captains & Directors

- Co-captain Angela Sheu
- Co-captain Faris Raza
- Mechanical Director Cole Massie
- Programming Director Anthony Furman
- Operations Director Leison Gao
- Shop Manager Leah Furman

Mentor Council

- FIRST Team Liaison and Lead Mentor Mornay Van Der Walt
- Fund-Raising Mentor TBD
- Technical Mentor TBD

Team 972 Organizational Chart



Leadership Roles

- LGHS Administration & Robotics Teachers Provide the necessary facilities, support, and leadership to ensure the success of the class
- Mentors Responsible for advising the team (teachers and students) on the technical aspects of FIRST Robotics, engineering best practices, operations, logistics and safety.
- Curriculum Council Responsible for creating an engaging curriculum that promotes learning.
- Co-Captains Responsible for leading Directors and team in collaboration with the Mentors and



Teacher.

- Directors Responsible for directing and distributing work to their respective sub-teams.
- Team Leads Responsible for leading a team, comprising 2 to 6 students, and reporting work to their respective director.

Sub-teams

All non-technical work on team projects is divided into different categories as indicated on the Org Chart and assigned to the corresponding sub-team. Each sub-team is headed by a student leader who delegates work to its members. Every student is assigned to one sub-team based on their application preferences. They will have obligations to this primary sub-team and be responsible for completing action items delegated to them. In addition, students are encouraged to join and participate in additional sub-teams, as long as they fulfill their obligations to their primary sub-team.

Sub-teams support the whole team in completing vital technical and non-technical tasks. These roles are essential to the overall success of the team.

Please See Appendix A for a full list of Student Roles & Responsibilities and Mentor Roles & Responsibilities

Domains of Jurisdiction

Team 972: Iron Claw Robotics operates fully under the jurisdiction of Los Gatos High School (LGHS). LGHS has ultimate and complete domain over the team and how it operates, allowing for the school at any time to make any decision regarding the team it feels necessary. Within this framework, however, **it is the school's desire to create a team that is student-run and student-managed to the fullest extent.** LGHS recognizes the enormous benefit of student-led learning and is proud that many aspects of this team are fully under the domain of students.

The robotics teachers operate as the school's representative, and thus decisions made by them are to be in the best interest of LGHS. Therefore, students and mentors will respect and follow the teacher's decision as if it were the school's decision. Any decision made by the robotics teachers must be made under the assumption of complete transparency, as all decisions may be brought to the LGHS administration if the need arises.

The following diagram shows the jurisdiction domains that pertain to the school and the student team members.



TEAM 972 DOMAINS OF JURISDICTION



School / Teacher Safety Equity Assurance of Learning & Engagement Management of Materials / Facilities Budget executive Personnel Decisions Outside of class activities	Overlap • Class curriculum • Budget • Materials • Projects • Competition Selection • Leadership Selection & Roles	 Students Complete domain over robot design, build, and operation Game and competition strategy & participation 		
Mentors				
Responsible for advising the team on the technical aspects of FIRST Robotics,				
engineering best practices, operations, logistics and safety				

Under the "School/Teacher" category the school aims for students to manage as many areas as possible, however the school retains the final decision. Similarly, the mentors advise students on items in the student section, however students retain the executive decision in their area.

Clarification of Bullet Points in Domains of Jurisdiction

- School/Teachers (Note: the teachers represent the school and the desires of the school, not the desires of an individual teacher)
 - Safety: A teacher may halt any activity at any moment if any activity may seem like it could cause physical or mental harm.
 - Equity: Teachers will ensure that all students are able to participate and engage in the team, and that students aren't unfairly depriving others of being engaged in the team.
 - Assurance of learning & engagement: Teachers main goal is to ensure that there is learning taking place that follows our Mission Statement. High priority is placed on all students having meaningful activities to engage in.
 - Management of Materials/Facilities: The teachers are in charge of all materials and equipment on the team regardless of how they were procured. Once an item is given/donated/bought it belongs to Team Iron Claw. The teachers are also in charge of all facilities that the team uses on campus, and as such, states when, how, and who will use them.
 - Budget executive: The teachers are in charge that donor and school's money is being spent responsibly. The teachers may approve or deny a purchase request.
 - Personnel decisions: The teachers have ultimate authority of who is in the class, and how many students are in the class. Teachers also have ultimate authority over which adults work with students and in what capacity. No adults have a right to work with students on the team; they need to be authorized by the school.
 - Outside of class activities: Any outside of class activities are designated team activities and under the jurisdiction of the school. Who, how, and when these activities are held is up to the teacher.



- Students
 - (Student Team Leadership to complete this section)
 - Mentors
 - Responsible for advising and supporting the team (teachers and students) on the technical aspects of FIRST Robotics, engineering best practices, operations, logistics and safety.

Team 972 Ethos

Students

- Honor, respect, & welcome mentors
- Are here to learn and actively seek out mentors' opinions and expertise.
- Work daily with mentors and include mentors in all decision-making processes

Mentors Do Not

- Design or CAD the robot
- Machine or fabricate the robot
- Assemble the robot
- Program the robot
- Fix the robot

Member Obligations & Opportunities

Class/Team Attendance & Participation Expectations

One of the most important aspects to being a successful robotics team member, and a person who is in the know and contributing to the team is showing up to our meetings. A yearly calendar of meetings is made before the year starts but it may be subject to change on rare occasions depending on particular circumstances. The team does not meet during finals week to allow students to focus on their academics.

There are two types of attendance for robotics: Class/Team Meetings and Open Shop Hours:

Class/Team Meetings

Class/Team Meetings are sacred and they are "required" attendance. Think of this as any other period during the day. For example, you would not schedule other competing activities during your English, Math, or any other class. You would even try to not schedule things like a dentist appointment or driver's test not during your class time. This leads us to our golden attendance rule:

Our Golden Attendance Rule:

Missing team meetings is only for <u>urgent, unplanned, and unforeseeable reasons</u> <u>or events</u>.

If you schedule or choose to book other activities during robotics, it will affect your standing on the team. If you continually ask teachers if you can miss team meetings for non-urgent, planned, or foreseeable events, it can/may affect your standing on the team. This team always has a long waitlist of students who want to get in – many of whom are 100% committed and dedicated to attending our hours – but because of our limited enrollment, we have not been able to allocate space to them.

• During fall semester, and after competition season we will meet during certain 7th period school days. During this time, you cannot miss a 7th period class for any other school related reason (sport or to go to another class).

- To clarify a particular example, no you cannot stay back to finish a test in one of your classes and miss robotics.
- **During Competition Season,** we will have a custom schedule and we will meet 3 times a week for 2 hours, and if requested have an additional 1 hour of Open Shops Hours after the class during the week We will also have Open Shop Hours during the weekends from 10:00 am to 5:00 pm which are split into a morning shift (10:00 am to 1:30 pm), and an afternoon shift (1:30 pm to 5:00 pm). Students are available to pursue other after school interests (sports, other clubs/teams) but they must balance these interests with their robotics attendance. If you miss too many class meetings during build season you may be dropped from the team.
 - Sports or other activities during build season.
 - If you would like to participate in any other activities during build season that will in any way affect your attendance during mandatory team meetings, you must get this *pre-approved* before Competition Season, or more specifically, before the 15th of December. If you plan on missing too many meetings, you will need to pick between that activity and robotics.
- There are typically around 160 Open Shop Hours during Build Season (1st week in January to the 1st week in March). Students should plan to attend between 6 to 9 hours a week of "Open Shop Hours" during Build Season. Students are required to attend 42 hours of Open Shop Hours, during build season. This represents 6 extra hours a week. As a point of illustration Many of the highly motivated and passionate students on the team typically log over 75 hours during the Build Season, with a handful of students logging close to the 160 hours.
- We will have a few mandatory *weekend* meetings a year that will be clearly shown in our team calendar. You are attending this unless you have planned something before the year starts, or you have

Open Shop Hours

• Open Shop Hours are <u>not</u> required attendance, however they are highly encouraged if you are looking to make a meaningful contribution and impact on the team. Even so, these shop hours may have a specific objective as ran by the Captains or the teacher where you may want to attend. Open shop hours may be ran by school approved mentors. As "homework", you have some amount of open shop hours you need to attend during competition season (see above).

Other Attendance Requirements

- The team competes in at least 2 Regional FRC competitions a year. These are 3-day events in March and April. *Students are required to at least attend 2 full days of competitions* not including the practice match days (1st day).
- The Curriculum Council (composed of the Robotics Teachers, Captains, Directors, Shop Manager, and sometimes mentors) meets weekly year-round. The CC must attend these meetings unless they have "*urgent, unplanned, and unforeseeable reasons or events that prevent them from doing so*".
- In addition to standard classroom hours, students will be assigned at least 4 hours a year of non-technical, teacher allocated work hours. These are discretionary hours decided by the teacher and usually involve shop maintenance. We have a large inventory of parts, materials, and cleaning that needs to be done by students to keep this team going. It is a very material intensive team, and the students are the ones that maintain it.



- Full participation in Iron Claw Robotics is a significant time commitment, depending on the area(s) worked. New students often participate at a lower level, easing into more significant roles in subsequent years. Students who are actively involved in build season, which starts the first week in January, and the periods post build season through the end of our second regional FRC competition at the end of March typically log 100 hours after school. Some students have been known to log over 200 hours during this period.
- LGHS students are free and encouraged to join any FRC team they choose, but they can only join one. While Team 972 strives to be as helpful as possible to all FRC teams out there, the team will not help another team comprised of LGHS students -- meaning that no other FRC team comprised of LGHS students will be able to use the school's facilities, materials, or student time/help. The school believes this separation is best to create a clear understanding that school resources are meant only to help LGHS students of Team 972.
- The teachers manage all team-related events outside of school. Anytime the team wants to attend an outside of class function as Team 972, they must get approval from the teacher or relevant mentor at least two weeks in advance.

Competition Logistics & Procedures

- All competitions are officially school field trips, and as such must follow all rules governing school field trip rules.
 - All members will travel with the team and in whatever fashion the school decides the team transportation will happen. This includes local field trips. Students will not arrive on their own accord, dropped off by their families, or with their own transportation. Traveling all together as a team ensures all students have transportation, accommodation, meals, accountability, and safety for all students. While FRC competitions are public events, students will be denied permission to participate with the team (in pits, stands, or in the field) at the competition if they do not travel with the team.
 - The team will pay for all student expenses at the competition. If enough funds are not acquired to pay for all student expenses *the school may cancel participation at the competition.*
 - Any request for fees or expenses associated with Team 972 field trips is a request for a *voluntary donation*. No student shall be denied participation due to failure to make said *voluntary donation*.
 - Education Code 48904 (b) (1) allows the district to charge for damaged school property or failure to return school property on loan to a student, should damage occur during a field trip.
 - Any chaperone that will transport participating students in their Private Car must complete and turn into the Principal a Private Car Travel Check.
 - The teacher reserves the right to remove any student from the field trip/event based upon information received from another staff member or behavior issues.

- The team will always endeavor to choose one local competition (around a 1 hour max driving time one way) that does not require obtaining accommodation. This is to allow all students the opportunity to attend at least one competition close to home, and to save team funds in attending competitions.
- Students have the ability to lobby for their competition location, but the teachers and mentor advisors have the final say. Any out of state competitions students desire to attend will be stated to the teacher by the end of September to allow adequate preparation.
- Team sponsored participation at certain remote and out of state competitions (such as FRC Championship in Houston) is not guaranteed to all members of the team, and nearly always a select group of students will attend. For distant competitions that may require expensive travel arrangements, the team will decide on an *objective, position based list* that does not include any student names. This list is approved by the teacher and/or relevant mentors. Please see *Appendix D* for an example of a competition priority list.
- In addition to limiting members attending distant competitions, only a limited, necessary group of students will attend the first day of competitions if the first day is only meant to work on the robot and attend practice matches. The whole team is not necessary to attend days where the robot will only be in the pit being worked on or practicing in the field.
- Appendix E list specific norms of behaviors for students during all field trips and competitions.
- The team will have a well-followed list of rules and guidelines for pit management. See *Appendix G* for our rules & guidelines of pit safety and management.

Leadership Team Selection

At the end of each school year, a selection of students will choose the next year's leadership team. This selection process is delineated in Appendix E. Leadership roles and responsibilities may be modified each year.

Students may simultaneously run for a Captain position and a Director position. The elections for Captain happen before the elections for Director, and if a student running for Captain becomes a Captain then he/she forfeits their candidacy towards the Director position. If the student does not make Captain, they can still run for a Director position.

No positions on the team are "grandfathered", and all students reapply and re-run for any position they want to keep for the following year. This means that no students automatically retain their positions from one year to the next. Specifically, to clarify, a student elected to Captain one year, is not automatically elected Captain the next year. Captains have a maximum 2 year tenure.Captains and Directors may be in any grade from Sophomore to Senior. For example, there is no rule stating that there needs to be a "Senior" Captain and a "Junior" Captain.

Communication Pathways

Information will be communicated to members over email, Slack, during meetings, and on the website blog.



- Email: all members are required to
 - Use and check their school email address for official correspondence from the team. Official communications from the teacher will be sent via Canvas which is the school email.
- Obtain a Slack account. Our slack workspace is ironclaw.slack.com
- Website: the team website is located at ironclaw972.org.
- Blog: Team 972 intends to maintain a blog on the website to inform members of the community of our progress.
- Stay up to date on the robotics season calendar as well as progress at individual tournaments at <u>thebluealliance.com</u>.

Team Finances & Fundraising

How Funding Works

Team 972: Iron Claw Robotics receives a certain amount of baseline funding as an electives class at LGHS each year. This funding covers some of the team's in-class instruction for robotics fundamentals, but is not even close to being able to cover the costs of building the robot itself, or of competing with the robot at the regional FRC competitions the team registers for.

To exist as a competitive FRC team, which requires both a robot and the ability to compete at a minimum of two regionals, the students must raise a significant portion of their own funding from a variety of sources:

- 1. Corporate sponsorships, donations, and matching;
- 2. Non-profit grants;
- 3. Local business sponsorships; and
- 4. Team 972 one-off fundraising events (Build-a-Bot, Drive-a-Bot, bake sales, etc.)
- 5. *Voluntary Donations* from parents/guardians of students, and their supportive family and friends.

Any funds raised during the school year that are not used to fund the above programs in a given year will be carried over and utilized the following year by the LGHS Ironclaw Robotics program.

Annual Budget/Fundraising Summary

The LGHS Robotics Program annual is **\$98,000** above the baseline elective funding provided by LGHS for in-class instruction. Students based their budgets and goals on previous year's participation in FIRST FRC and worked with the Finance Mentor Group to develop a comprehensive fundraising plan to secure sizable contributions from multiple sources.

These programs will afford the LGHS Robotics Class Students the opportunity to participate in three competitions that are beyond the scope of the LGHS Elective in-class instruction as outlined below:

Program	Description
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1	Participate in Fall preseason competition using the previous season's FRC robot.			
2	Organize In-Class Competition to train newer members and an Advanced Subsystem Project to train senior members.			
3	Build a FIRST FRC robot during the FRC build season (January to first week in March)			
4	Participate in one local FIRST FRC Regional Competition.			
5	Participate in a second local FIRST FRC Regional Competition.			
6	Participate in a third FIRST FRC Regional Competition			
Funding for Programs 1 to 5 \$48,000				
5	Should the team qualify - to participate at FIRST FRC Houston Championships. This will require travel expenses for the students, teacher and mentors from SF Bay Area to Houston, and freight transportation of the robot pit.			
Funding for Programs 5 \$50,000				
Total Funding for Programs 1 to 5 \$98,000				

The students have set a goal of raising \$700 per student from *voluntary donations* from Friends and Family. These donations are *completely voluntary*, yet a critical source of fundraising. All donors are encouraged to check if an employer matching donation program can boost their contributions, if yes, we request the donor make the matching donation request on behalf of the team with their employer.

Sources	Description	Goal
1	Student-Led Friends & Family Fundraising (50 Students)	\$35,000
2	FIRST & STEM grants from FIRST partner corporations	\$12,000
4	Sponsorships from Wildcat Foundation, local businesses, and organizations	\$35,000
3	3 Fundraising events (holiday parade, build-a-bot, gofundme)	
Total Fun	\$98,000	



Two easy ways to make a Voluntary Donation

- **Donate directly to the team**: You can pay via personal check or credit card. With the credit card you will be paying via PayPal and PayPal does add a 2% "convenience fee".
 - By Credit Card:
 - Please log on to <u>https://lghs.myschoolcentral.com/</u>
 - You will need to create an account. Please follow the instructions under "My Account" link.
 - Under the tab "Product Categories", choose "Robotics Donations". Follow the checkout procedures and it will redirect you to PayPal.
 - By Check
 - Please give it to the teacher of the class. If sending with your student please include it in an envelope and state if you would like a receipt.
 - Make checks payable to: Los Gatos High School
 - Memo: FRC Robotics T0504
- Request a matching donation from your employer: Many companies will offer matching donations, and these can be a *huge* source of funds for our team. Talk to your HR person or appropriate corporate representative about matching your donation to this worthy cause. We can provide receipts of your donations so you can pass it on to your accounting representative to provide a matching donation.

Connect us to your connections: Please let us know of any groups, clubs, foundations, businesses, meetups, churches or otherwise to which you are connected, that we might be able to speak with them about possible donations.

Mentor & Volunteer Information

Parent Involvement

Our student-led team is supported by many parent volunteers and adult mentors. All families volunteer in some capacity, such as providing snacks or meals, rides, event support, or after school supervision. The adult mentors are parents, teachers, older siblings, and other adults who offer their technical or business expertise.

This team cannot run or exist without adult mentor support! Please consider joining!

How Parents/Adults can Get Involved in the team

There are many ways to support Iron Claw Robotics.

- Gift your expertise and become a Technical Mentor
- Join the pool of general Parent Volunteers dedicated to logistical and administrative support
- Donate money or help raise funds.

Three Types of Volunteers/Mentors

1) **Technical Mentors.** These mentors are approved by the robotics class teachers to work with students. These mentors work directly with students in guiding them on robotics, fundraising, logistics, and all other team aspects. They are approved by the district (TB tested and fingerprinted). These mentors can supervise students.

- a) Tier A: These mentors are cleared by the school to open/close the shop facilities and supervise students. These mentors may run outreach events with students.
- b) Tier B: Mentors help out with all technical mentors aspects, work directly with students, but do not open/close shop.
- 2) **Logistical Mentors.** These mentors work directly with the teacher and sometimes with students in coordinating much of the logistics in running the team. This could be travel, finances, meals, coordinating other mentors, etc. These mentors are also TB tested and fingerprinted by the district.
- 3) **General Parent volunteers**. These adult volunteers help out by providing meals, giving rides, and other activities that do not involve working or supervising students.

Become a Technical Mentor

Iron Claw is a student-led team, which means that the students hold full authority and responsibility for designing, building, testing and fielding the robot. Technical mentors nevertheless play a significant role by helping students become a more effective team in achieving their goals, and most importantly, learn engineering. Technical mentors interact with and advise students on all technical aspects such as robot design, prototyping, manufacturing, assembly, programming, and testing. During the build season, they help supervise students during the build, participate in design reviews, provide advice about technical planning/execution, and ensure that school rules are adhered to. These mentors may also participate in pre-season class instruction and coaching. Mentors with no prior experience and are interested in helping in any way are welcome to participate. Specific areas of expertise that are helpful include mechanical design, prototyping, manufacturing, CAD and programming.

How will Technical Mentoring Work?

There are a few ways to be a technical mentor

1. Be a Regularly Attending Mentor

The **best way** to help the team is to show up on a regular basis to team meetings. This could be every meeting, once a week, or some other regular recurring schedule that is relatively frequent. This is the most useful type of mentoring because:

- a. Students and mentors build a good relationship of working together
- b. Mentors get a holistic understanding of where the team is at and what they can help with. Mentors can further advise teachers and student leads on where and how the team can improve.

2. Run a Lesson or a Workshop

If mentors can't commit to regularly attending team meetings, and mentors have a useful skill or knowledge they can teach the team, we can set up a lesson or workshop where a mentor could come in for a limited number of meetings to run the workshop.

3. Wait for Specific Invitation

This is if you have the least amount of availability. In this case teachers or students will send out an email of specific mentoring, or a specific request. For example this could be requesting help with programming, CAD, project management, or that the team is holding a design review.

4. Show Up When You Can!



Lastly, if none of the above work you can show up when you can. PLEASE email the teachers to let us know you are coming. We may have some special events going on that would not make it a great day to come by.

Regardless of what capacity above you want to work with the team, please email the teachers if you want to come by; especially if you are in the "Show up when you can" category. Some days may not be very useful to show up as we may not be doing technical work.

Help with Fundraising

The team needs to raise a significant portion of its budget externally (above what the school provides for class instruction). Details of the budget and fund-raising plans have been provided in a previous section. The team seeks finance mentors that can help with students maintain season budgets and advise all fundraising activities. The mentors also interface with the FRC program and coordinate competition registration, fee payments, and grants through the FRC website.

Become a Parent Volunteer

Finally, the team is looking for parent volunteers that can help with all non-technical aspects of running the team. Volunteers are needed to help prepare for parent meetings, make registration packets, set up the FRC kick-off event at school, organize build season meals & snacks, set up logistics for competitions (both local and away), and plan the end-of-season party. Please note that these roles do not need a major commitment of your time - for instance, we may need help to drive students or transport meals, etc. So, consider joining the pool of general volunteers if you can help in any way.

Official Rules & Guidelines for All Team Members

Student Code of Conduct

Robotics is a complex team that operates under the rules of multiple organizations -- Team 972, Los Gatos High School, and FIRST -- and has multiple groups as participants: teachers, mentors, general parent volunteers and students. As such, the team has a more complex set of agreements and rules that need to be followed versus a regular school class. The school and teacher understand that learning and adhering to these rules is not always immediately learned and understood by all students, and thus endeavors to coach, teach, and work with students in understanding the rules. These rules and agreements are modeled after what an effective and ethical team or organization would expect.

• Team members will be good humans.

Before any robotics activities happen, students will learn the social rules that govern civility, kindness, and proper behavior to create a safe, inclusive atmosphere for all students. the school will endeavor to teach this as their first priority. The team endeavors to reflect the diversity of the school it represents.

• Team members will exhibit appropriate behavior at all times.

Team 972 expects all students to be mature and professional at all times and to follow all rules of FIRST, LGHS, and Team 972. Students must know that whenever they are in public for a team-related activity, they represent Team 972, FIRST, and LGHS. More specifically, team members are to refrain from mocking, bullying, inappropriate displays of affection, and any other behavior which could be construed as exclusive or uncomfortable for others.

Team 972 endeavors to be competitive, but not at the expense of decorum and graciousness in competing with other teams. Team 972 fully agrees with the principles of "Gracious Professionalism" and "Coopertition" espoused by FIRST, and if it can, will offer assistance to other teams in need. During competition, Team 972 will encourage, cheer, and support other teams, and if Team 972 loses we will congratulate the other teams.

• Student team members are here to learn.

Team 972 honors the fact that many mentors spend a considerable part of their free time coaching and managing the team. The school and students shall

- Recognize that without mentors the team would not be able to function, or have the ability to run its multiple events and hours.
- Understand that students learning from mentors is a specifically stated goal of the team, and a key to success.
- Be reverent and respectful of all mentors and volunteers that work with the team. All students will verbally acknowledge mentors, create a welcome space for them, listen to their ideas, and with respect agree or disagree with a mentor when offered advice.
- Students will acknowledge that having mentors help guide their decisions is not only integral to their success but a privilege that should be fostered with gratitude. Students are expected to alert the teacher to any complaints they have about any mentor or other volunteer working with the team.

• Team members will stay engaged with team tasks, projects, and goals.

The robotics team is a team that engages in "serious fun." Students are in the robotics team to learn and engage in robotics, or <u>actively seek out</u> more work that promotes extended learning in their area or furthers the team's progress toward stated goals. Students are expected to be engaged at all times if they are in the lab, and if, after class hours, they want to socialize, they must leave the lab to do so. <u>The robotics lab is only for working on robotics.</u>

Team members are expected to put away all cell phones and not work on anything else during robotics. Playing video games, surfing the internet or any non-contributory actions will earn a consequence. Cell phones may be used for robotics related activities.

Students are expected to work in the area of the field listed in their project management during normal class hours. Students must apply themselves to a sub-group but may change their subgroup through discussion with the teacher and team leads.

- Team members shall respect, support, and honor all decisions made by the team. This holds for robot-specific technical decisions as well as management-related business decisions. No individual student is allowed to do as they please with the robot if the team has decided in a fair and equitable way which direction to take. The teacher is tasked with ensuring that all decisions made by students are decided in a fair and equitable way, and may create these decision-making processes for the team.
- Team members will know the Domains of Jurisdiction, Material & Facilities Management Rules, and will comply with legal directives given by lead students, mentors or teachers.



• **Team Meetings** are highly revered and respected as a critical part of our team's operation, given that our key decisions and learnings happen during meetings. Unless absolutely necessary during the meeting, students will have all electronics put away and closed to fully pay attention during meetings. Team members doing other items during team meetings, not applying themselves, or breaking our meeting norms will receive warnings, consequences, and may be removed from positions of importance. Students understand that these guidelines apply in all formal and informal meetings.

• Other important rules & guidelines

- Students will respect the branding standards of our team and not put any other brands/logos they design on our robots. Students will definitely not inscribe, put their initials/names into team equipment.
- All team student team members who are students will equally participate in class activities. No senior students are exempt from learning activities or competitions. Although students mentor each other, all students accept that they are in the learning stage or robotics, and are not exempt from learning activities.
- Any student who has an issue with a mentor who is affiliated or related to another student on the team will in no way discuss or put any responsibility of the mentor's actions on the student.

Diversity & Inclusion Clause

Iron Claw Robotics is committed to fostering, cultivating, and preserving a culture of diversity, equity and inclusion.

We embrace and encourage our team member's differences in age, color, disability, ethnicity, family, gender identity or expression, language, national origin, physical and mental ability, political affiliation, race, religion, sexual orientation, socio-economic status, and other characteristics that make each of us unique.

All members of the Iron Claw Robotics Team have a responsibility to treat others with dignity and respect at all times. All team members are expected to exhibit conduct that reflects inclusion during class, at class functions on or off the school site, and at all other team-sponsored and participative events. At no time will members discriminate or mistreat against others based on any of the aforementioned traits.

Any team members found to have exhibited any inappropriate conduct or behavior against others may be subject to disciplinary action.

Team members who believe they have been subjected to any kind of discrimination or mistreatment that conflicts with the team's diversity policy and initiatives should seek out a teacher or administrator. All information shared with teachers and administrators will be treated with utmost respect and privacy for the individual expressing grievance.

Material & Facilities Management Rules

The LGHS Robotics Lab and Machine Shop serve as the two primary workspaces for almost all robotics activity on the team.

Rules & Guidelines

- All materials and funds, *regardless of how they are procured*, are owned and managed by the school. All workspaces on campus are owned and managed by the school.
- Where, when, and how students may work in LGHS facilities is fully under the domain of the teacher or the school's representative put in charge by the teacher.
- No team member is ever to work without a teacher, mentor or assigned volunteer on site.
- Organization and clean-up of our materials and facilities is paramount, and comes before any learning or robotic activities. All students will participate in these activities regardless of their respective group or sub-team. Students are expected to refrain from social activities during Clean Up times.
- Food and drink is, for the most part, never going to be consumed during our team meetings. Students, mentors, and teachers will eat and drink ideally outside of team meeting times. If any eating/drinking is happening, it will happen in the foyer if no equipment is out there. Students will never, ever eat with any equipment, tools, or our materials around.
- Stealing or purposeful negligence of team materials will result in serious consequences; some may be severe depending on the infraction and may include expulsion from the team and/or further administrative consequences from LGHS administration.
- Students will not tag, graffiti, or decorate anything on any team equipment. "Tag" or "Graffiti" includes writing your name on parts or making any funny or joking signs. If students want to make any kind of non-robotics related signs, or write anything on any equipment or facilities, this might be allowed, but they will always ask for permission of the teachers first. All equipment is owned by the team and this equipment is solely managed by the teachers.
- Students will not use any materials for their own purposes. This includes 3D printing or laser cutting materials for anything fun or personally related. The laser cutter and 3D printer is not public domain for you to grab material and make whatever you want.
- When finished using a tool, equipment and materials, it must be returned to its designated location in the lab or shop. At the end of every work session, all tools, equipment and materials must be put away. If a member leaves before a work session is over, that member must check in with the shop manager on what to clean before she/he leaves. This could be for a maximum of 15 minutes.
- Members are not allowed to leave the lab before notifying and signing out with the teacher, mentor, or assigned lab volunteer.
- Always wear safety glasses and other pertinent safety equipment when in the back half of the room where the work tables are present or in the machine shop.
- Only students allowed in the machine shop are the ones previously cleared to work on the machines. Any student who allows others to work on the machines will be revoked of the privilege to work in the machine shop for a specified time by the teacher.
- If a power tool malfunctions or breaks, it must be reported to a teacher/mentor immediately.
- Electrical devices of any kind may never be powered by daisy-chaining cords or power strips.
- Loose hair and long clothing must either be tied back or removed before a member is permitted to use any machine tools.
- The teacher, mentors, and adult lab volunteers always have the final word in any situation where safety is at stake.

Consequences for Unacceptable Behavior

Most students, if not all, will at some moment make wrong choices or mistakes in their behavior. Teachers are here to accept that students (and even teachers and mentors) may occasionally blunder



in their judgment, and that is normal. Teachers are here to coach and guide students in proper behavior with patience and respect.

That said all students, teachers, and mentors will be accountable for their mistakes. Being on Team 972 is a privilege, not a right, and students may receive the following consequences for unacceptable behavior:

- A meeting or a discussion to discuss their behavior.
- Time spent working for the teacher as a consequence.
- Suspended from working on particular equipment or materials.
- Removal from leadership position (parents and school administration alerted).
- Suspended from class for the day (parents and school administration alerted).
- Suspended from class for various days (parents and school administration alerted).
- Expulsion from the team (as decided by school administration).
- Other consequences as deemed by Los Gatos High School administration.

These consequences do not need to be followed in order, and a more severe consequence may be administered with no lesser consequences if a single infraction is egregious enough.

Robotics is a class meant for a mature, morally conscious student. Robotics is a special class on campus as students:

- Work independently often unsupervised.
- Work with equipment that is very expensive, difficult to obtain, and potentially dangerous.
- Are often working outside of school hours.
- Are working with non-faculty, adult members of the community that deserve respect.
- Often work in distant out of school locations representing the team in public events.

Given that, if students show repeated lack of judgment in following the rules, and they have been given multiple instances of correcting their behavior, it may be imperative for the school to expel them from the team. Expulsion from the team may happen in a severe single instance or if there have been repeated infractions with multiple consequences. Given that, it is the school's <u>utmost</u> goal that students *stay on the team*, are given fair chances to learn proper behavior, and if mistakes are made students learn without needing any further consequences.

Mentor & Volunteer Oath

As a mentor or volunteer on the team

- I understand that the school, and the teacher who represents the school, hold ultimate responsibility for the direction of, and decisions related to the team.
- I will address and speak to students with patience and respect when attempting to guide or teach them.
- I understand that the school wishes the team to operate as independently as possible, but the school reserves the right to step in and make decisions as it sees fit at any time.
- I understand that the school manages and approves all parents/adults working with the team, with the goal of creating a safe space for students.
- I am here to represent and work towards the overall good and best interests of the team as a whole. I am not here to represent or lobby for my child, or any specific group of students, and generally will "check my kid at the door."
- If an issue arises where there is a conflict of interest, such as a discussion related to my child, I will recuse myself as appropriate. I may represent my child separately in a parental role.

- I will be cordial, polite, and assume good intentions of everyone in the group. While I may have passionate opinions about a topic, I will address issues and not people.
- I respect and promote FIRST's principles of allowing the team to be student led as much as possible without compromising safety, equity of access, and general fairness.
- I will respect the Domains of Jurisdiction of the team: decisions left to the school and decisions left to the students.
- As a mentor or volunteer with the team, I may be privy to some personal information about students that I am not allowed to share or discuss with others.

Teacher Oath

As a teacher and representative of LGHS:

- I have the overarching goal of representing the school's interest in promoting learning, equity of access, general student well-being, safety for all, and conserving/protecting facilities and equipment.
- I operate under the primary goal of creating a positive learning environment and overall benefit/wellness of the team. All actions will be for the good of the team.
- I respect and promote FIRST's principles of allowing the team to be student-led as much as possible without compromising safety, equity of access, and general fairness.
- I endeavor to manage the team with as much involvement and representation of mentors and students into the decision-making process.
- I respect decisions that are in the student domain, decisions that are in the mentor domain, and decisions in the school domain.
- I will be cordial, polite, and assume good intentions of everyone amongst students, mentors, and volunteers.
- I will grow the program sustainably, increase diversity, and secure educational materials and facilities.

Appendices

Appendix A: Yearly Calendar

We will often meet during 7th period. See this calendar for details.

Appendix B: Team Positions & Descriptions

Student Roles

Above and beyond all specific duties shown below, students who apply to lead positions endeavor to be **coachable** in their fields. **Coachable** is as important (if not at times more important) than absolute skill or knowledge.

Captains & Directors

The Captains and Directors are the primary student managers of the team. They create, supervise, and manage the work of their respective teams, and should be well-versed in each area of expertise in their team.



Curriculum Council:

- Comprised of the Co-Captains, Operations Director, Mechanical Director, Programming Director, one discretionary Shop Manager as decided by the teacher, and the Mentor Council members..
- Meet weekly to decide plans, curriculum, and logistics of the team.
- Meet for up to one week (maximum 5 working days) over the summer to plan the upcoming year.

Co-Captains:

The two co-captains will BOTH have the following qualities & duties:

- Are one of the primary student managers of the team. Above any technical or work related topics, they create, manage, and supervise the work of the rest of the team.
- With the curriculum council creates curriculum, goals, class projects, and daily agenda, in advance.
- Meets *weekly* with the teacher and curriculum council.
- Meets for a maximum 5 days in the summer to plan the school year.
- Assist in meeting and maintaining "Domains of Jurisdiction".
- Works to encourage meaningful engagement of all members.
- Mediate and solve team-wide problems.
- Ensure team unity and rewards/acknowledges work of exemplary members.
- Is the primary liaison between students, mentors and teachers, and as such, maintains a positive working relationship with all mentors and teachers of the class. Assumes good will and positive intentions.
- Is respectful of the teachers, mentors, and school that is the team owner.
- Will attempt to "pick up the slack" by *delegating* or leading anything not covered by another team leadership role.

The two Co-Captains may/will split the following responsibilities so that each one is being done by one of them:

- Create and tracks a daily *personnel management system (The board)* that:
 - Prioritizes jobs and activities to each team member.
 - Ensures tasks are given out to each member of the team for each meeting.
 - Delegates managerial duties to other directors or leads.
 - Is user friendly, easy to follow, and accessible for all students to use.
- Manages a project management system (Project Plan or Task List) that:
 - Creates and stores all tasks and projects the team wants to work on.
 - Tracks all dates and benchmarks during the competition season and offseason.
 - Updates project plan according to subteam progress.
 - Ensures there is proper adult staffing if a school staff member cannot open shop.
 - Is user friendly, easy to follow, and accessible for all students to use.
- Creates a specific project management system for build season (Gantt Chart/Task List)
 Shows the workflow of the complete robot build.
- Organize and run all student team leads together and schedule meetings.
- With Operations Director, communicates all important events/information to all students with plenty of advance notice.
- Assists teachers in communicating all important events/information to mentors and parents.
- Manages the Battle Rhythm and helps teachers to ensure big-picture team commitments are being met – competitions, overall season, travel logistics, budget, business plan, etc.

• Coordinates amongst the 2 captains so that at least one captain attends all outreach events, new member meetings, parents meetings, competitions etc.

Operations Director:

- The primary manager of the Operations Team. Above any technical or work related topics, they are tasked with managing and supervising the work of their group and ensuring it is being performed adequately.
- Coordinates all operational and organizational activities of the team, including finance, fundraising, general administration, logistics, communication, and networking.
- Helps the fundraising, finance, general administration (program manager), and communications lead achieve their goals depending on what the priorities are at the moment.
- Delegates tasks to non-technical leads and members.
- Starting in the Fall Season they are tasked with effectively *networking* with other FRC teams and other groups that will bring benefit to our team. Identifying neighboring teams our team wants to build a relationship with, and purposefully reaching out to build a rapport, learn, and help each other out.
- Attends nearly all networking/fundraising events.
- Helps and ensures General Admin (program manager) lead is organizing all of our online. documentation (Google Drive), and maintains it easy to use and navigate. Keeps files organized and purges old, useless documents. Completely creates a new folder every year.
- Sends out all communication reminders regarding team meetings via any of our communication portals.

Mechanical Director:

- The primary manager of the Mechanical Team. Above any technical or work related topics, they are tasked with managing and supervising the work of the mechanical group and ensuring it is being performed adequately.
- Has a keen awareness of the many hardware resources (electrical, motors, sensors, etc) made available by FIRST and the FRC community, and how to leverage them as needed for the overall improvement of knowledge and skills of all members of the mechanical team including themselves.
- Has a good understanding of FRC robot subsystem design and operation, for example drivetrain, intakes/outtakes, game piece indexers, climbers etc).
- Is proficient in using all necessary machines in the machine shop, or is actively working towards proficiency in all machines.
- Delegates tasks to mechanical leads and members.
- Provides overall guidance and vision for the mechanical (CAD, machining, assembly, electrical & pneumatics) portions of robot creation.
- Holds and manages regular weekly Team Update meetings during the competition season to review robot design and progress with students and mentors.
- Along with the Shop Manager, is responsible to ensure the machine shop/engineering room are open if they want it staffed, and should alert the teacher within a minimum 48 hours in advance if the team wants the machine shop open.
- Ensures proper education and training of all mechanical team members. Ensures members are following the rules and not using machines if not approved. Ensures members in the machine shop are allowed to be in there.
- Makes sure mechanical team members are engaged in the robot building process
- Maintains engineering documentation for the season.



- Creates schedules and deadlines for individual mechanical tasks during the competition season.
- Leads the mechanical prototyping at the start of the build season in close collaboration Programming Director, and Co-Captains.
- Is the designated Co-Pit Executive at Competitions with the Programming Director.

Programming Director:

- The primary manager of the Programming Team. Above any technical work related topics, they are tasked with managing and supervising the work of the programming group and ensuring it is being performed adequately.
- Beyond having experience with programming concepts, code reviews, testing, troubleshooting and quality assurance of code, the Programming Director should also be proficient in programming and testing various FRC specific robot control systems.
- Leads whiteboard sessions with the full programming team and interested mentors to plan out subsystems and commands for robot projects during the pre season and once robot functional requirements and robot subsystems have been agreed upon and documented after game reveal.
- Has a keen awareness of the many software resources made available by FIRST and the FRC community, and how to leverage them as needed for the overall improvement of knowledge and skills of all members of the software team including themselves.
- Ensures full engagement of all programming team members throughout the preseason and competition season.
- Ensures proper education and training of all programming team members.
- Creates schedule and deadlines for specific programming tasks during the competition season.
- In collaboration with the Mechanical Director, provides overall vision and guidance for the programming, troubleshooting and testing (autonomous, teleop, end-game, and vision systems) portions of the robot.
- Ensures that Co-Captains, Mechanical Director, Robotics Teachers, and interested Mentors are aware of the status of robot code and its development.
- Actively collaborates with the Mechanical Director in organizing the repair of the robot.
- Leads and delegates programming of the scouting app for competitions.
- Maintains software documentation for the robot and the scouting app.
- Monitors the status of scouting app development and works with scouting app lead to ensure scouting app quality and completion.
- Monitors the status of robot code development and quality with the Robot Programming Leads.
- Ensures the leads update as needed software documentation for the robot and the scouting app.
- Meets up before August of the upcoming school year to plan and delegate across the programming team the appropriate software updates for the LGHS laptops used by the team.
- Is the designated Co-Pit Executive at Competitions with the Mechanical Director.

Shop Manager

(Note: the teachers are by default the primary shop manager, but this student is the primary student manager)

- This position is appointed by the school's representative.
- This position is a Curriculum Council position, and is someone who can add value and insight to all Curriculum Council meetings.
- Leads a team to ensure the following tasks are completed. May delegate (with teacher approval) the following tasks, but is ultimately responsible for their completion.

- Is primarily responsible to ensure the machine shop/engineering room are open if the team wants it staffed, and should notify the robotics teachers and lead mentor within a minimum 48 hours in advance if they want the machine shop open. Mechanical Directors also have a shared responsibility to ensure this happens.
- Is responsible and in charge of all materials and equipment on the team. This person may need to devote extensive time to how all tools work, where they go, maintenance of them, and storage.
- Is interested and engaged in researching/purchasing new technology the team could use (CNC machines, laser cutters, 3D printers, etc).
- Keeps track of inventory, and has a clear inventory checklist in our Google Drive.
- Creates and manages a pit checklist for competition.
- Notifies other leads when parts need to be restocked.
- Creates orders for materials and equipment that need to be bought to support the operations of the team. Is in charge of adequate returns so the team can be reimbursed.
- Promptly inventories new materials that are purchased, updates order forms, and alerts team members when supplies have arrived.
- Helps organize people to clean our workspaces and storage spaces.
- Designs the pit layout with input from other leads and sign-off from the Robotics Teachers.
- Is superbly proficient in all hand and power tools (or is willing to learn!).
- Works in the Pit as the Safety Captain during competitions.
- Makes sure that students are being safe while working (both with fabrication and while working with the completed robot)
- Makes sure that the metalshop is regularly cleaned by everyone
- Any student may make nominations for Shop Manager to the teachers. In your nomination, to be seriously considered, please address the aforementioned skills the shop manager would possess and why the person you are nominating would be a good fit for the position.

Team Leads

Team leads are students who are especially proficient in the skills that pertain to their role. They assist the Captains and Directors in managing and training their subteams.

CAD Lead:

- Is proficient in the skill of Computer Aided Design (CAD) with whatever CAD program the team is using.
- Follows the design decision made by the team at the start of the competition season and leads the CAD team to CAD the robot accordingly, unless a change is agreed upon in the leadership team.
- Trains new members about CAD software, including good design strategies and practices.
 - Works to find and create a good CAD curriculum.
- Delegates CAD assemblies and ensures their timely completion.
- Creates a clear organizational system for CAD's, and creates a systematic, efficient naming conventions and facility of access.
- Leads the integration of individual assemblies into a final assembly.
- Works with the other mechanical leads to ensure feasibility of all parts.
- Communicates with the mechanical captain and the rest of the team the status of the design
- Keeps a binder of all robot CAD drawing files that are given to machining team (may delegate)
- Manages the creation of all drawing files to pre-arranged specifications.
- Is proficient, manages, teaches the creation of CAM files.



• Meets up before August of the upcoming school year to update CAD software for imaging all computers (if necessary).

Electrical & Pneumatic Lead:

- Is the lead of a group of students devoted to electrical/pneumatics, and may delegate tasks to ensure the following is done. However, this lead is in charge that these items are completed.
- Is proficient in all electrical and pneumatic skills required by the team.
- Is in charge of all batteries, and has all knowledge of how to test, operate, store and correctly discard old batteries no longer required by the team.
- Manages an inventory list of all electrical and pneumatic components
- Labels and tracks status of all electrical components (creates a spreadsheet to do so). Tracks firmware updates and operational status of component.
- Oversees proper implementation of electrical systems and pneumatics into the robot
- Works with the mechanical team/designers/ and CAD team to design and assemble the electrical board as well as other electrical components on the robot
- Works with the substem teams (mechanical and programming) to wire up sensors and other electrical components as necessary.
- Trains members about crimping, soldering, fitting pneumatics, and other electrical skills.
 Creates tests and guizzes to ensure electrical team is demonstratively proficient.
- Very proficient with hand and power tools. Has extensive experience in all electrical measurement tools (multimeter, power supplies, battery beak, etc).
- During build season ensures completion of electrical tasks in a timely manner when necessary
- Keeps an organized engineering notebook and documentation system that tracks where things are plugged into the robot, and creates a comprehensive wiring diagram that programmers can easily read and understand for their programming purposes.

Manufacturing Lead:

- Works very closely with the metal shop teacher.
- Is proficient in using all necessary machines in the machine shop, or is actively working towards proficiency in all machines. Manages the manufacturing of parts corresponding to the design.
- Trains all members interested in manufacturing on the machines.
- Ensures that anyone working on the machines has passed the necessary tests approved by the Industrial Technology Teacher.
- Ensures members are following the rules and not using machines if not approved.
- Works with all designers and CADers to ensure manufacturing feasibility of all parts.
- Keeps manufacturing on schedule and creates fallback plans if necessary.
- Has specific duties during the build season.
 - Is primary manager of a Machining Task List.
 - Ensures that there is clear communication between designers (maybe CAD'ers or not) and the machining team.
- Keeps an organized engineering notebook and comprehensive documentation throughout the year
- Preference is given to a member who is in ourLGHS Metals Program and is adept at CNC usage and other equipment in the Machine Shop.

Programming Leads (Currently 3 Programming Leads are allocated to cover different areas)

- Decide along with the Programming Director what areas they want to focus on leading and short to long term programming goals for the season.
- Create and maintain an easily accessible FRC Control Systems programming curriculum used to help train new students leveraging resources from FRC WPILib website -

https://docs.wpilib.org as well as shared resources from the FRC Community.

- Research and identify useful libraries, and delegate research on particular areas of interest.
- These research tasks should be delegated inclusively within the robot programming subteam.
- Provide overall guidance and vision for the programming control systems (teleop, autonomous, vision, testing, etc.) portions of robot:
 - Specific responsibilities during the off-season can be assigned flexibly and dynamically.
- Maintain code to ensure that code structure, proper documentation, telemetry, and logging are done while facilitating knowledge transfer across the programming team and aiding with more efficient troubleshooting of code issues.
- Manage code status and updates, including when the code should and should not be changed, as well as checking code quality through PR reviews and leading Code Reviews.
- Manage multiple student programmers to ensure all programmers are meaningfully engaged.

Scouting App (Programming Lead):

- Starting in the preseason, leads a small team to create and maintain a scouting app:
 - Scouting App includes easily accessible UI and useful data gathering tools along with data visualization.
 - The app is very modular, allowing for quick and easy changes from year to year and during competition season.
- Works closely with the scouting and strategy lead to develop and refine the app.
- During pre-season, creates, modifies, and maintains the app with feedback and testing.
 - Tests different potential app layouts and designs with feedback from team and research from other teams.
- During build season modifies the app to work with the current game, after receiving instructions from the strategy lead on what data is needed and not needed. After a competition assesses the quality of data and what modifications should be made.
- Works on any other app requirements, such as a publicity board.
- Delegates these tasks inclusively within the scouting app subteam.

General Administration Lead/Program Manager:

- Leads a small team (3-4) students that can manage administrative team tasks
- Updates all tracking spreadsheets
 - Attendance
 - If students are absent, they will email admin lead and teachers. Admin lead will update it on the board.
 - Manage much of the team's data
 - Updates to documents.



- Update profiles and information of students (positions, jobs, other personal (non-classified) information)
- Student Hours (extra duty, off season hours, extra jobs)
- Creates/prints/laminates documents to be distributed in class:
 - Posters, calendars, handouts, board names
- Manages student lists and documentation
 - Students attending weekend shop
 - Students attending build season
 - Students attending out of class events
 - Students attending competitions
- Manages/creates forms/polls for students to fill out
 - Meals, preferences, travel restrictions, apparel, any other information.
- Works well and directly with Captains, Directors, and Teachers to manage all lists and schedules.
- Skills necessary: Word, Excel, and the Google Suite (Docs, Spreadsheets, Slides). If not proficient, is willing to learn these programs.

Finance Lead:

- At the start of the school year, works directly with the Robotics Teachers, Finance Mentor, Co-Captains and Operations Director to review the prior years budget and create a new team budget for the coming school year and FRC Season.
- Works directly with the Robotics Teachers to ensure changes (inflows and outflows of funds) in the Robotics Teams ASB account are accurately recorded in the appropriate Google Sheets.
- Keeps our Google Sheets team budget sheet updated at minimum on a weekly basis, but ideally every meeting.
- Keeps track of who has bought items and turned in receipts and who needs to be reimbursed.
- In collaboration with the Robotics Teachers, approves and denies team purchases, especially if not included in the original budget.
- If required, keeps a Bill of Materials (BOM) for the competition season robot.
- Is well versed in Excel programming or is willing to learn it well.

Fundraising Lead:

Works with a small team of students to:

- Organizes fundraising team to fill out grants, contact corporations, and run other fundraising campaigns
- Works with the Budget Lead and team captains and directors to determine fundraising goals
- Looks into new methods of fundraising
- Sends thank you letters before 2 weeks of receipt
- Designs material for fundraising, including brochures, posters, etc.
- Keeps up sponsor relations

Communications Lead:

Works with a small team of students to:

- Prepares a business plan/team branding upon consultation with captains & directors.
- Post on social media to promote Team 972 and highlight team events and activities that may be of interest to followers of the team.
- Ensures the website is regularly updated to promote Team 972 in the best possible way to the followers of the team and other FRC Teams interested in learning more about Team 972.

- Ensures the students on the media team are taking and uploading photos and videos to the Google Drive on a regular basis.
- Ensures branding standards are updated and followed.
- Ensures that a robot release video is completed by our first regional competition.
- Ensures that a season recap video is complete 2 weeks after our final competition. (latest end of April).
- Organizes a team photo yearly and uploads it to the team website.
- Ensures that t-shirts are designed and ready to be ordered by the end of January ahead of the teams first regional competition.

Competition Team Roles and Selection

Roles during competition are different than the roles during the year. During competitions, there are specific roles to field and run our robot, and there are specific roles to enable quick decision making.

During competitions, DVC decisions are suspended as there is not enough time to use this process. There are various competition executives that have the authority to change, modify, alter any strategy, tactics or robot modifications.

For all positions, they will either be elected positions, or assigned positions. Elected positions will be elected by DVC described in this section. Assigned will be assigned by CC with pre-approval needed by teachers before students can apply. (Note: previously made form for DVC elections is <u>here</u>)

There will be 3 main groups of students during competition: Strategy Team, Drive Team, Pit Crew.

The following table shows all the student roles that must be satisfied for every competition:

Drive Team		Pit			Strategy		
Position	Method Assigned	Position	Position Method Assigned		Position	Method Assigned	
Driver	Tryout	Programming Director (Pit Executive)	Assigned		Strategy Chief	DVC Elected	
Operator	Assigned	Mechanical Lead (Pit Executive)	Assigned		Scouting Lead	Assigned	
Human Player	Assigned or Tryout (depending on task)	Mechanical & Assembly (multiple)	Assigned		Scouters (multiple)	Assigned	
Drive Coach	Assigned	Electrical, Pneumatics Assembly (multiple)	Assigned				



Each role is described in more detail below.

1. Strategy Team

The strategy team is comprised of the Strategy Chief, Scouting Lead, and Drive Coach. The Drive Coach serves as the main liaison between Strategy Team and Drive Team.

• Strategy Chief (DVC elected position)

This person is the face of our team and must be very assertive, have excellent communication skills, and know the rules and our robot's capabilities extremely well. Before every match, the strategy chief will first look at our scouting data and talk to the scouting lead about our opponents and alliance partners. They will then set up a meeting with representatives from our alliance partners to determine strategy. They will meet with the Drive Team and get everyone on the same page. The Drive Team is required to follow the directives of the Strategy Chief. While not technically on the drive team, the strategy chief determines the match strategy and is our team's representative to other teams. The strategy chief will lead the creation of our picklist. During alliance selection, they will make the decision on whether to accept or turn down offers from other teams or will be the person inviting teams to our alliance.

• Scouting Lead (assigned position)

The scouting manager maintains and coordinates the scouting app, creates scouting shifts, notifies people of their shifts, and ensures the completeness and accuracy of data during the match. They provide data and work closely with the strategy chief in order to make match strategy and determine alliance selection. They will be watching most (if not all) matches and should have a good idea of the performance of many teams. It is ideal if they should have programming experience but not required. All drive team applicants agree to attend all games including Houston if we make it.

2. Drive Team

The Drive Team is comprised of: Operator, Human Player, Technician, Drive Coach, Driver. As a basic requirement, all Drive Team members:

- Agree to attend all competitions, including Houston, when they get selected/approved for their position.
- Agree to follow all instructions of the Strategy Chief.
- Agree to work well together as a cohesive unit.

• Drive Coach (DVC elected)

The drive coach coordinates everyone during match play and must have a solid understanding of game rules. The drive coach should work closely with the strategy chief and should always look at the bigger picture of the match. They must always keep track of the time remaining, the points in the match, and should weigh these factors when making decisions. Instead of micromanaging the driver, the drive coach should relay the bigger picture of the match to the driver and operator. Here are some pointers from ChiefDelphi: "For example, call outs like "our teammate has not filled the vault, leave the switch and run a few cubes" or "our teammate's lift just snapped in half, come place scale," or as someone else said, calling out changes in switch ownership is incredibly helpful as they are very easy for a driver to miss in the heat of a match."

"As a driver that has driven under two separate coaches, both with very different coaching strategies, I can tell you that it is so much easier when the coach lets you play the micro game, and they play the macro game. This year our coach told me which alliance had which game objectives, how many cubes down on the scale/switches we were, how many more cubes we needed for certain power-ups, and timing reminders for climbing. This allowed me to decide what to do with each cube, based on what I thought would be best. I like this method because there's no disagreements between drivers and coach, and you don't lose any time due to communication."

• Operator (DVC elected)

While the driver controls the drivetrain during a match, the operator controls all other subsystems on the robot. The operator must have proven abilities to work and communicate well with the driver, drive coach, and strategy chief, and must dedicate lots of time during build season for practicing with the driver. The operator must remain calm and be able to deal with the stress, pressure, and exhaustion of many matches during the day. The operator needs to know the rules extensively (fouls, tech fouls, safe zones, pinning), and must have good hand-eye coordination and know the controls exceptionally well. The operator must work with the programming team to design the operator controls. The operator must have a good idea of the capabilities of the robot and what would break the robot (how vulnerable is the robot when the intake is out? will the robot tip over when the elevator is up?).

• Technician (elected position)

The technician must have programming experience and should be able to diagnose and fix issues on the fly. The technician must be able to set up the robot and turn it on. The technician should also understand basic electrical and be able to push the robot cart. They should be assertive and should ask mechanical/programming people in the pit if they do not know the technical state of the robot. The technician will be an advanced programmer who will be working closely with the pit programmer to ensure the robot is running smoothly. The technician is also in charge (or in charge of delegating) our pit display and ensuring it is working. If a technician is busy, they will adequately delegate this job.

• Driver (Try out position)

The driver, simply, drives the robot. While the requirements and description for this position are not large, this is one of the most important positions on the team. It is essential that the team identifies the best driver that the team has. This will be selected using an objective, drive-based challenge described in another document. The driver has the responsibility to start practicing driving as soon as



there is a robot and course available (January/February). The driver needs to work closely with the programming team to identify an easy set of controls that they can use to drive the robot. The driver does not, however, decide what the robot does. The driver follows the instructions of the Strategy Chief and Drive Coach.

Selection of Application-Based Positions on Drive/Strategy Team

Application process for the drive team (not including driver) will start in December. People who want to join the drive/strategy team will submit an application. The first part of the application is pre-approval by the teachers. The teachers will check if the student is in good standing in all aspects of being a team member. Additionally, the teachers will ensure that the applicant is aware of all the requirements and expectations of the position. For elected positions, the second part of the application is a form-based application that will be public to the team. Applicants will take care to message their application well as this is the main source of information they will be judged by.

These applicants will be selected using a point/voting system and voted on by the DVC. The point allocation system is as follows:

Description	Points	Reasoning
Year on the team	4th year: 4 Points 3rd year: 3 Points 2nd year: 2 Points 1st year: 1 point	It is fair to allocate more points to (1) more experienced members on the team, and (2) students who are older and have less of an opportunity to participate in competition. This point augmentation is meant to be small compared to the points allocated by DVC, but significant enough to give some consideration based on experience.
Votes Given by DVC	Based on current DVC attendance. Up to 25 points.	Allowing voting by the DVC makes the process democratic. While points will be allocated if you have some seniority, the majority of the points allocated to members will come from this category which validates the team's confidence in their ability.

Other Selecting Guidelines:

- If a tie occurs between applicants the more senior student (first by grade then by years on team) will get the position. If there is still a tie after that, the decision will be made by the CC and if it is one of the CC members they will excuse themselves from the vote.
- All positions need to (eventually) get above a 90% on the rules final. This is important as all of the drive team needs to know the rules very well.

- The DVC will, with truthfulness and integrity, use the application answers by each applicant, and objective reasons to cast their vote. This is not a popularity contest, but who is best for the job. DVC will at all costs avoid cronyism.
- You may be released from the position by the teachers for inadequate job performance or other inadequate behavior. In addition, the CC may request that a position be re-assigned and this needs to pass through the teachers for approval.
- Due to the fact that the drive team needs a solid score on the rules final, this team will be decided by the end of Build Season Week 2 after all retakes have been given.

3. Pit Team

Pit Executives

The "Pit Executives" are the Programming Director and Mechanical Director. The responsibilities and tasks of the two "Pit Executives" are

- All robot decisions. Have the final say on what work is being done on the robot and what sequence to do the work.
 - Any work that *modifies the "basic" strategy* of the robot needs to be brought up with the Strategy Chief.
- Managing, directing, and planning all work being done on the robot
- Planning a sequence of work during competitions
 - For example, both will plan a sequence of tasks between matches that will be done with the robot
- Directing and communicating the work to pit personnel of what tasks need to be done.
- If both Robot Executives mutually disagree on a decision, the tiebreak will be decided by (listed in order of priority and if the first person is not immediately there it will go to the next person on the list)
 - Strategy Chief
 - Pit Mentor.
- Must be at the competition site the entire competition.
- Must attend all matches and first-hand observe what is happening with the robot. (Ideally seats are saved and reserved for them)
- Follow the robot to the practice field.
- Need to listen and accept feedback from other pit personnel and pit mentors.
- Keep everyone apprised of all decisions. Will be assertively vocal in doing so.
- Check in with Strategy Chief and Drive Team to get direction on what to work on.
- Are assertive, vocal, respectful, constantly communicating, and not timid in giving instructions to pit personnel.
 - If Robot Executives are not performing management then this will default to the Pit Mentor.
- Are always planning the future and the next series of steps that need to happen with the robot and robot/drive team preparation.
- Will speak respectfully to all pit personnel.



Other Pit Roles

Pit Safety

This position is as decided by the teacher and they will wear the Safety Button. This position used to be automatically given to the Shop Manager, but now they are assigned to a person who can fulfill mechanical duties in the pit. This will be assigned by the teacher to a person who is already assigned to be in the pit; so this will not be a new person.

- First and foremost be a valuable mechanical/electrical/programming/assembly pit member
- Manage and direct the safety and cleanliness of the pit.
 - Ensure hair ties, safety glasses, and other protective equipment are worn.
 - Keep floor area clear of items
 - Keep table tops clear
 - Directing people to put away tools DIRECTLY after they use them.
 - Ensure any and all water bottles are labeled.
- Work towards any safety award we are going for.
- Is one of the mechanical pit personnel. They may be the same person as Pit Executives.
- This person ensures that the pit is staffed at all times. They are staffing it, or delegating it to others. This person HAS to delegate it to others and is FORCED to take a couple breaks a day.
- They will post a schedule of
 - When and which students are working in the pit
 - Match schedule
 - When and which mentors are pit mentors

Pit Awards Presenter

- A person in the pit dedicated to presenting any and all awards we are going for.
- This person will be a good speaker and be able to speak with judges and other personnel clearly and succinctly.
- They have a clear understanding of our robot and team model.

Pit Mentor

- Is actively involved in all decision making discussions.
- Is the primary Pit Safety and Org executive (most tasks and decisions will be completed by Safety and Org student). They can give any directives that are related to our equipment, organization, or safety. They may stop work on the robot to ensure these items are done.
- Follows the robot to the practice field, and watches all matches to fully observe robot performance.
- If there is more than one pit mentor for the competition then a schedule will be made and posted in the pit.
- Is a full member of the pit, and thus allowed in the pit, but when not directly involved is posted slightly outside the pit.
- Will inspect/test the robot to gather information.
- Will not work on the robot.

- Will not touch the robot or any equipment unless the following scenarios:
 - Students are incorrectly doing a task and it needs to be demonstrated.
 - Inspecting/testing robot.
 - There is a safety reason to intervene.
- Will not clean, organize, set up, but *will* direct these tasks if they are not being done.
- Will direct the pit team and individuals if the Robot Executives are not doing so. Robot Executives may challenge or modify Pit Mentor's directives.
- Will respect the final decision of the Robot Executives.
- Will speak respectfully to all pit personnel.

Adult Roles: Teachers

Robotics Teachers

- Is the primary lead of the robotics team and the school representative. Along with the Metal-Shop Teacher has executive decision making abilities with regards to all team decisions.
- Drives the structural organization of the team with direction from Mentor Council.
- Adopts lead mentor role for FRC purposes
- Works with student leads to set preseason and postseason curriculum and projects
- Works with student leads to set expectations and process during build-season
- Works with mentors to get support in curriculum and build-season support
- Works with mentors to get support for FRC-related planning and execution
- Conducts design reviews during build season
- Posts team roster with photos for attendance during build season
- Posts list of students authorized to use machines in absence of metal-shop teacher
- Responsible for any disciplinary action for students (shared with metal-shop teacher).
- Responsible for all human resources issues: interpersonal issues, complaints, staffing, attendance, etc. (Shared with metal-shop teacher).
- Works to grow the program sustainably, increase diversity of the student body, and secure educational materials and facilities.
- Is the administrator for student communication forums related to robotics. Such as slack.
- Is the facilitator for all meetings: ironclaw all, design reviews, mentor council, etc.
- Creates lists of mentors and trains mentors for shop access.
- Creates the school calendar for the year

Industrial Technology (Metal Shop) Teacher

- Working with the robotics teacher, has executive decision making abilities with regards to all team issues.
- Teaches students on safe use of machines and certifies students for using machines
- Interfaces with manufacturing leads on use of tools and materials during build season
- Interfaces with robotics teacher and parent mentors about student machine use

Adult Roles: Mentors

Types of Mentors

Parent mentors and volunteers are organized into three groups, each with a lead mentor. These are:



• Technical Mentors

These mentors work directly and advise students on all technical aspects such as robot design, prototyping, manufacturing, assembly, programming, and testing. During the build season, they help supervise students during the build, participate in design reviews, provide advice about technical planning/execution, and ensure that school rules are adhered to. These mentors may also participate in pre-season class instruction and coaching. They are approved by the district (TB tested and fingerprinted). These mentors can supervise students.

- a) **Tier A:** These mentors are cleared by the school to open/close the shop facilities and supervise students. These mentors may run outreach events with students.
- b) **Tier B:** Mentors help out with all technical mentors aspects, work directly with students, but do not open/close shop.

• Logistical Mentors

These mentors work directly with the teacher and sometimes with students in coordinating much of the logistics in running the team. This could be travel, finances, meals, coordinating other mentors, etc. These mentors are also TB tested and fingerprinted by the district.

• General Parent Volunteers

These adult volunteers help out by providing meals, giving rides, and other activities that do not involve working or supervising students.

The three mentor leads and several other key mentors are part of the curriculum council and attend monthly "org" meetings with the teachers and student leads to help plan aspects of the class, build season, and competitions.

Specific Mentor Roles

1. Parent Team Coordinator (2 Positions: Primary and Secondary)

The primary role of the Parent Team Coordinator is to help coordinate non-technical, operational issues to help the team function. They will work closely with the teachers of the class. It is important to note that this position is as much (or more) focused on *recruiting other volunteers* to help complete these tasks as much as completing them themselves.

- Helps create and maintain volunteer mailing lists of parents that can help with all these tasks. Shares this list with the teacher.
- Manages all food events during build season and during field trips.
- Helps maintain student roster along with allergies, medications and special needs
- Maintains communication with teachers, mentors, students & parents
- Provides general guidance or assistance to teachers, mentors, students & parents
- Arrange accommodations, travel arrangements, meals and snacks for competitions
- Organize pot-luck for kick-off brunch
- Organize build season meals, snacks & drinks based on student work schedule
- Organize end-of-season party

Specific Away Field Trips Works with the teacher to help manage the following tasks:

- Has a contact list, roster and information of all students and adults attending
- Disseminate information to all people during the whole field trip
- Manage all food events.

- Helps book accommodations
- Helps book transportation. Both to/from competition and while at the competition

2. Build Season Coordinator/Manager

- Helps set up after hours mentor supervision schedules for workspaces.
- December or at Kickoff establish base work calendar days/hours
- Weekly during build season confirm upcoming needs and adjust as necessary
- Assist Teacher in identifying Adult Mentor openers/closers
- Ensure openers/closers are trained on procedures
- Ensure adequate coverage of openers/closers, based on agreed work schedule.
- Oversees opening/closing of shop.
- Ensure proper management of facilities.
- Helps manage student attendance and participation during build season.
- Helps at one or more competitions.
- Approve student purchases during build season.

Areas where Build Season Coordinator Recruits Volunteers

- Technical mentors
- Shop openers/closers
- Trip technical coordinators

3. Trip Technical Coordinator

- Sets up and manages trip logistics.
- Shipping of technical materials. Creating a crate if necessary.
- Manages our travel equipment and process: trailer, load in, load out.
- Works to set up pit organization and logistics.

4. FIRST Team Liaison & Lead Finance Coordinator

- Set up FIRST FRC program registration of all students.
- FIRST related grant and re-grant management.
- FIRST Regional Competition registration.
- FIRST Nationals/World team and housing registration should the team qualify.
- Scholarships from FIRST.
- Oversees the Budget and Fundraising Mentor's who work with students to maintain the budget and fundraising worksheets. These mentors assist with the collection of money and managing the budget spreadsheet
- Set up a regular schedule to meet with finance student lead and update the budget.
- Submit reimbursements to ASB

Appendix C: Application Process to Join the Team

Application Process

Timeline

Process



Feb/March	Sign up for the robotics "class". This does not guarantee you a spot on the team but puts you on the list for an application		
Early April	 All students attend mandatory orientation meeting. Students submit written application 		
Mid April	Teacher recommendations dueApplicant Interviews		
Early May	Students receive acceptance notification.		

How the Applicants are Scored

Students are chosen based on a point system. There are 150 points possible.

The scoring is as follows:

- Written application (40 points)
 - The written application will be read blindly and assigned a point value based on quality of responses.
- Teacher recommendations (50 points)
 - The teacher recommendations form will be read blindly and assigned a point value. Each recommendation will be out of 25 points.
- Interview (60 points)
 - Students will interview in front of teachers and team mentors. Each interview will be scored based on quality of responses.
 - Note: Due to the huge number of applications the team receives yearly (over 80 often), and the lengthy nature of the interview process, the team teachers reserve the right to fast-track any applicant whom has previously been on the team, or who was in any of their classes, and has demonstrated proficient traits to skip any portion of the application process the teachers see fit.

Given that we are a student led team, it is fundamentally imperative to the team that we have a wide representation of grade levels on the team. The team's survival depends on having a balance of experience from veteran to new students. Given that requirement, out of 50 students we attempt to fill *at least* 12 positions in grades 10 -12.

Given our need to have a diverse team in terms of grade level, we have a two-part system for accepting students on the team:

1. **Automatic Admission Spots (36 of the 50 spots).** All the positions in this category have achieved, after applying, *higher point score than the average* of all students who have applied. Within this limited group, 12 positions are given to the top point earners in each of the grades 10-12 respectively. If we do not achieve Automatic Admission Spots for a certain grade, those extra spots go to the General Applicant Pool category. For example, if we only get 10 applicants in grade 11 who's average score was above the average, then we only accept 10 and the remaining 2 spots go to the General Applicant Pool.

2. **General Applicant Pool (14 spots).** These remaining spots are allocated by top points regardless of grade level (freshmen included).

Appendix D: Competition Attendance Priority List

Note: This is an example of a competition attendance priority list for distant/costly competitions. It may change depending on the competition and specific needs, which are made based on the team's robot; not based on particular student preference.

An example is below but more details of teams of different sizes are here:

https://docs.google.com/spreadsheets/d/1CveUVP_aiJw4IALNn1Mg5sa1xCzQR9reQ6ko3honHco/edi t#gid=1259666683

	Primary Required Positions						
	# of Students	Primary Required Positions	Team Description	Student Name	Secondary Position Assigned	Third Position Assigned	Gender
۳	1	Driver	Drive Team - Drive Team Button				
ear	2	Operator	Drive Team - Drive Team Button				
еT	3	Human Player	Drive Team - Drive Team Button				
riv	4	Drive Coach	Drive Team - Coach Button				
	5	Technician	rive Team - Technician Button				
	6	Pit Manager, Safety & Organization	Pit Crew - Safety Button				
	7	Robot Manager	Pit Crew				
it	8	Mechanical & Assembly	Pit Crew				
Ъ	9	Mechanical, Electrical, Assembly	Pit Crew				
	10	Electrical, Pneumatics & Assembly	Pit Crew				
	11	Programmer	Pit Crew				
	12	Strategy Chief	Game Play Strategy				
	13	Scouting Manager	Game Play Strategy				
	14	Scouter 1	Game Play Strategy				
egy	15	Scouter 2	Game Play Strategy				
rate	16	Scouter 3	Game Play Strategy				
Sti	17	Scouter 4	Game Play Strategy				
	18	Scouter 5	Game Play Strategy				
	19	Scouter 6	Game Play Strategy				
	20	Scouter 7	Game Play Strategy				
			Secondary & Thi	rd Required Positio	ons		
	# of Students	Secondary Required Positions		Notes			
ε	1	Back up Driver	Should ideally be a Scout from th	e Game Play Strategy Group	p - Can be a third position	assigned	
eal	2	Back up Operator	Should ideally be a Scout from th	e Game Play Strategy Group	p - Can be a third position	assigned	
еT	3	Back up Human Player	Should ideally be a Scout from th	e Game Play Strategy Group	p - Can be a third position	assigned	
riv	4	Back up Coach	Strategy Chief is back up coach				
	5	Back up Technician	Can be a third position assigned				
	6	Back up Pit Manager, Safety & Organization	Ideally someone already in the pi	t			
	7	Back up Robot Manager - See notes	his student needs a deep knowledge of Mechanical, Electrical, Pnuematics and Assembly of the robot. This student will onfirm any robot repairs and changes with Technician to confirm if robot code will need to be updated or edited out due to roposed repairs or changes.				
Pit	8	Awards/Tech Binder Presenter	Inter One person assigned and responsible, but all Pit Crew members can present. Should be delegated and NOT Pit M e Notes One person assigned and responsible, but all Pit Crew members can manage. Should be delegated and NOT Pit M and Robot Manager.			e delegated and NOT Pit	Manager and
_	9	Game/Field/Pit Media - See Notes				Manager	
	10	Pit Electrical, Pneumatics					
	11	Pit Programmer					
	12	Pit Mechanical & Assembly					
VB	13	Back Up Strategy Chief	Usually Drive coach				
ate	14	Back Up Scouting Lead	Should ideally be a Scout from th	e Game Play Strategy Group	р		
Stra	15	Scouting App Lead	Fixes/upkeeps any issues with the	e scouting app			



Appendix E: Student Rules & Norms For All Competitions/ Field Trips

- The teacher and school is in charge of all students while they are at any event. Students will follow all legal instructions/directives of the teacher and "mentors in charge" (the list of managing mentors will be provided before the trip). These instructions will include directives on setting up our equipment and facilities, moving equipment, setting up our hospitality area, attending team meetings, etc. There is a lot of equipment and material to unload, load, set up. Students are there to enjoy the competition, but also there to work to set up all their equipment, facilities, and help manage the overall function of the team's attendance.
- Students will not leave the event or premises. Or students will not leave areas where they are expected to be (hotel, competition site, etc), unless they are given special permission to do so.
- Students will conduct themselves in an appropriate manner at all times that brings respect to the school, Team Iron Claw, and FIRST organization. Students will follow all school rules and FIRST rules while at the competition.
- Students may not drive other students to the event.
- Students understand that ultimately if they cannot follow these rules parents may be required to pick them up. Parents understand that teachers will work with individual students to help them follow the rules but if they cannot they may be required to come pick students up.

Appendix F: Decision Voting Council

972 Robot Decision Guidelines:

	Positions		
1	Co-Captain		
2	Co-Captain		
3	Mechanical Director		
4	Operations Director		
5	Shop Manager		
6	Programming Director		
7	Electrical Lead		
8	Machining Lead		
9	CAD Lead		
10	Programming Lead		
11	Programming Lead		
12	Programming Lead		
13	Programming Lead		

Decision Voting Council:

14	Reserve Position (By students in CC)
15	Reserve Position (By Teachers)

Summary

The team will have a *Decision Voting Council (DVC)* that has executive deciding power on all design and strategy decisions for our competition robot. This council will be comprised of students in the curriculum council, all technical leads (12 students total), all students that have served 3 or more years on the team, and 2 potential reserve spots. One decided by students in the CC and one decided by the teachers.

This DVC is intended to be a democratic process that includes as many students on the team as possible, but still allocates the most important robot decisions to a select set of experienced, qualified students on the team that have the experience and wisdom to create the best choices. The DVC will never be smaller than 1/4 of the total team size and never larger than ½ the team size; this will ensure that decisions never remain in the jurisdiction of the most experienced students. If the DVC is larger than 20 students, there will be no reserve spots added. If 19 students are on DVC, both reserve spots will be used.

As per our Domains of Jurisdiction, all *design* and *strategy* decisions are fully in the domain of students. That said, all DVC meetings can and/or will be held with technical mentors present if they are interested and able to attend. Students make the final decision, but as our Team Ethos states students will take all mentor information into consideration before making decisions.

Tiers of Decisions:

These decisions only apply to **top level robot functionality (i.e. what the robot can do during a** *match***). Any other design decisions will be dealt with by their respective sub-teams as long as they adhere to the overall design and strategy decisions set at the beginning of the season.**

1. Insignificant decisions not required by DVC.

- a. A technical mentor (acting as a neutral 3rd party) will decide if a decision is a "small decision" that does not require DVC approval.
- b. This includes improvisation during manufacturing or assembly that helps execute the original design and strategy.
- c. For example, slightly changing the length or hole pattern of certain parts or using different spacers can be advised by lead members, and they do not need DVC approval.

2. Significant decisions that require DVC approval

a. These are larger decisions that require a vote of the full DVC team and they will follow the meeting protocols shown below.



Meetings:

Meetings may often be very last minute and may occur with little anticipation. All students can and are encouraged to attend meetings, but decisions are only decided by DVC members. All decisions will be majority decisions with the members present at the moment. There is (currently) no quorum for attendance; meaning only the DVC members in attendance will vote on the decision. Nearly always, DVC meetings will be scheduled with a *full day's anticipation* by the captains to all students on Slack These meetings will be posted by 9 PM and ideally should happen after 5 pm to allow mentor attendance. In addition to the meeting announcement, as much information as possible regarding the decision in question will be posted on team discussion sites (Slack) to allow DVC members to formulate their opinion and position.

DVC meetings will be run by either captain, and captains will, with the team's best intention, formulate a set of choices for the DVC to vote on. If these set of choices is not deemed as an accurate representation by the teacher the teacher will formulate the set of choices for the meeting. Captains will set a duration to the meeting time (30, 45, 60 minutes, etc), and at the end of the discussion a vote will take place.

In critical but likely common occasions when time is very limited (such as the end of the build season), a lead mentor or teacher may decide that a DVC meeting may be held *immediately* with whomever members are present.

In summary, the only DVC meetings that are not passed through a designated lead technical mentor are meetings that are posted by 9pm for the next day starting after 5PM. All other design changes are passed through mentors as immediate DVC meetings or potential small decisions that do not require a DVC meeting.

DVC Voting

All voting for DVC decisions will be blind voting. No voting member, while voting, will know what or how other members are voting. Teachers, if necessary, will proctor and count votes.

Appendix G: Competition Pit Rules & Procedures

Pit Rules

- 1. The PIT MENTORS are ultimately in charge of all operations, safety, and materials in the pit.
- 2. The two PIT EXECUTIVES are in charge of all robot operations. All questions regarding who, what, when, how with the robot is decided by the two PIT EXECUTIVES.
- 3. Shop Manager will typically be assigned to the Pit Safety role. PIT SAFETY will guide all cleaning and ensure the pit is safe.
 - a. *All* pit crew will *immediately* put away and clean their tools when done.
- 4. 6 STUDENTS MAX in the pit at one time. The people in the pit are clearly marked on the schedule that is premade.
 - a. If Pit Executives invite someone in to do work they must send someone out. The numbers in the pit will stay constant.
- 5. 2 PIT MENTORS MAX assigned to mentor pit duty. Ideally 1.

- 6. The area outside the pit is open for visiting by students, parents, and mentors BUT
 - a. If it gets too crowded, Pit Mentor, Safety, or Pit Executives may (politely) ask people to leave.
 - b. People outside the pit are not dialoguing with people inside the pit unless they are:
 - Strategy Chief, Drive Team, Scouting Lead, or on some other list of dedicated students that need to discuss with pit personnel.
- 7. There will be one pit crew member inside the pit at all times.
- 8. Only bags allowed in the pit area for the people working in the pit.
- 9. Water in the pit is for PIT PERSONNEL only and all water bottles will be labeled with students/mentors names with sharpies.
- 10. Drive Team should not be in the pit unless requested by pit personnel. DRIVE TEAM will be accessible nearly immediately.
- 11. Saucy computer clause: No food will EVER be allowed in the pit. NO EXCEPTIONS!
- 12. People in the pit will speak in respectful nice tones.
- 13. People in the pit WILL clearly communicate their intentions and speak clearly to all members involved.

Pit Procedures

- There will be a daily pit meeting to start the day. Priorities will be stated by Pit Mentors, Pit Executives, and Strategy Chief.
- There will be an official debrief in the pit *after every match*. Students may discuss what happened on the walk back, but a complete debrief will happen in the pit with all relevant personnel: Pit Executives, Strategy Chief, Drive Team, Pit Mentor, Pit Crew. These people must be present for this meeting. This meeting will be complete but will be short, to the point, with quick decisions made.
 - After this debrief the two Pit Executives will quickly outline a course of action (mechanical work, programming work, driver practice, etc).
 - One member of the pit will update all competition team members with a Slack message. This will be detailed and respect the fact that the rest of the team wants to be involved in what is happening.
 - Drive team (if not pit personnel) will leave after the meeting, but need to be accessible to come back and operate controls if necessary.

Appendix H: Student Leadership Selection Process

Students may run for Captain and 1 other director position.

Nomenclature:

• Student Voting Committee: comprised of all student team members including graduating seniors. Voting is *mandatory* for students on the team and part of your grade. Seniors may not opt out of voting or they will be penalized. Voting Committee includes current candidates running for Captain and Director positions. There needs to be 80% of the Voting Committee present and voting for the election to be valid. First years on the team are allocated 2 voting



point, second year 3 voting points, 3rd years and above 4 voting points. Students who are not seniors and not returning are not in the voting committee.

- Mentor Voting Committee: a group of minimum 3 mentors and maximum 6 (including the teachers) selected by the teacher who have worked with students frequently during the past year and can adequately judge each applicant's technical, nontechnical, and leadership skills. Mentors are allocated the minimum number of voting points (whole number) to make up <u>at least</u> 20% of the vote.
- Leadership Application Form: composed of all team positions with adjacent check boxes to indicate application.
- Candidate Speeches: A speech and interview in front of the voting committee where candidates need to answer questions pertaining to time commitment, leadership skills, and technical experience pertaining to the position.
- Election Administrator: a non-voting, non-student member administering the election.

Preliminary Election Steps

1. Pre-Approval of Captains & Directors by Teacher

All captains and directors have a much higher workload than other members. They work closely with the teacher in managing the team and creating a curriculum. The teacher will look closely at each candidate and pre-approve if each candidate has the required engagement, maturity, and dedication to be Captain or Director. This pre-approval process is done in private form before the candidate reveals their candidacy.

2. Limitation of number of Applicants

In order to run these applications in a timely fashion, and allow each candidate to speak during for a live interview, there will be the following applicant limitations set in place:

Captains: 6 applicants

Operations, Hardware, Software: 5 each.

If there are more applicants in each of those sections than described above, then the following will be done:

- 1. Candidates will first be asked if any want to drop knowing the large number of applicants.
- 2. If not enough people drop, there will be an initial ranked choice vote with no interview and no application form distributed to the voting committee. The top 5 directors or top 6 captains will move on to the next steps of the applicant process.

Given that each candidate's speech takes around 10 minutes in total, if there are more than 10 applicants in total for all positions, then the Captains election will take place one period, and the Directors election will take place the following period. A special team meeting may be added to make this election happen.

3. Leadership Application

- a. Applicants check off the positions that they are interested in on the Leadership Application Form.
 - i. Any team member may apply to any position with the exception of Captains/Directors who have served their full tenure. Tenure for team captains or directors is 2 years consecutively or non-consecutively.

b. The questions on the Leadership Application Form will be made by students and ratified by the teacher and Mentor Voting Committee. The Interview Question Document will not be released until the election day.

Election Day

- 1. Candidate Speeches For Directors & Captains
 - a. Candidate Speeches will start with the Captains first, then the voting committee will vote for Captains. The election administrators will announce the new captains and the same process will begin for the directors.
 - b. The Candidate Speeches will be conducted between the Election Administrator and the Directorship or Captainship candidate in front of the Student and Mentor Voting Committee.
 - c. The process of Candidate Speeches is as follows (note this schedule may be modified by the teacher depending on how many applicants there are):
 - i. All candidates will have 1 minutes for an opening statement
 - ii. 5 minutes for Live Leadership Interview in which questions from the Interview Question Document will be asked including relevant position-specific questions
 - iii. Finally 3 minutes of open questions from the voting committee overseen by the Election Administrator.
 - iv. Candidate has the option of a 1 minute closing statement.
 - v. Other candidates will wait outside the room during their competitor's interview.
 - vi. The Election Administrator may make a motion to proceed to the next step if the current step seems done. A member of the Voting Committee may halt that process if they have further questions.
 - d. Upon completion of candidate speeches, voting commences.
 - i. All voting is ranked choice, and will be tabulated using a formatted spreadsheet. In ranked choice voting, the person with the minimum number of votes is removed, and the second choice votes of the people who voted for the last place applicant will be distributed to the remaining candidates. That process continues (of removing the last place candidate and redistributing their votes) until there are only 2 captains left or 1 director.
 - ii. Ballots are counted and verified by a minimum of three independent adult teachers/mentors on the team: the class teacher, mentor, and/or a student alumni if available. The tally of votes for each person is confidential and not released to the team. Only winners will be announced.
 - iii. If serious concerns exist from either the mentor council or class teacher they may remove an elected individual and a re-election for that position will commence.
 - e. If the Captain position only has two candidates or a Director position only has one candidate, the candidate will give a 3 minute speech on the given interview topics in place of the Live Interview. These captains or directors need to be ratified by a ²/₃ majority of the team.
- 2. Subteam Lead Appointment



- a. Once the team of Captains and Directors is finalized, they will deliberate and present a list of sub-team leads to the robotics teachers. The old CC will join in this process. They will document their reasons for this choice. The new and old CC will be careful not to announce who they chose until they pass the next step.
- b. The new and old CC will present their sub-lead choices to the teachers. The teachers must ratify the Captains' and Directors' choice of individuals for the lead positions *before* they are announced. If the teachers do not approve the new team leads, the Curriculum Council must reach a compromise.
- c. In the case of a sub-team lead position having no applicants, a CC member or teacher may ask a qualified team member who did not apply if they are willing to fill the position, and processes 2a and 2b are repeated.
- d. The Voting Committee ratifies the selection of the leads through a Google Form in a simple majority. Teacher counts votes.

Election Yearly Schedule

- a. Last Class Day in April
 - i. The students who are interested in being a Captain or Director will submit their names to the teacher via email or a form. Submit by Friday, end of the week.
- b. First full week in May:
 - i. Monday: The teacher will get back to students regarding their approval to run.
 - ii. 2nd Class day of the week: Leadership applications and Specific Interview Questions for Captains and Directors are released.
- c. Week 2:
 - i. Monday: The applications for all positions due, and candidates' applications revealed to the robotics team.
 - ii. 2nd class day of the week. The applicants for Captains and Directors have live interviews, after which the voting committee decides the new Captains and Directors.
- d. Week 3:
 - i. Monday: The new crew of Captains and Directors presents their decisions for sub-team leads in a meeting with the teacher and the Mentor Committee.
 - ii. Wednesday: The Teacher approves or denies each position with Directors making changes as necessary.
 - iii. Friday: The sub-team lead applicants are notified whether or not they were chosen.
- e. Week 4
 - i. The new crew is ratified by the voting committee.
 - ii. If a "lead" spot is not ratified or if no suitable person is found it may be left unfilled until the start of the new year.

Appendix I: FAQ Regarding Iron Claw Team

Please click <u>here</u> to see our Frequently Asked Questions.

Appendix K: Driver Contract

Driver Excerpt

Driver will be decided by tryouts. During the preseason, the curriculum council will determine an equitable driving test for tryouts. Every student that wants to tryout must get a chance. The team will offer at least one practice session for all students before the driving test. The student with the best objective results will be nominated as the driver. The student with the second best objective result will become the back-up driver. Before the driver and back up driver is accepted in this position they must review the requirements below.

Driver Tryout Process

The Driver Tryout Process is described in detail in this document.

Requirements

Driving the robot is a privilege. The Curriculum Council and the Teachers have the ability to take this away if we see fit.

By accepting driver position, this student:

- Is well-versed in game rules and strategy (Superior score in rules test).
- Mandatory attendance to ALL competitions and scrimmages. This includes all regionals and World Championship in Houston if we qualify.
- Commit to extensive practice time at the end of Build Season (Consider ~ 6-8 hours of just driving time at the end of Build Season)
- Pro-actively coordinates with other teams if they have mock up practice fields we can use. (if necessary)
- Works well with other members of the Drive Team
- Understands that driving strategy is a team decision mostly split between the coach, strategy lead, operator, human player, and likely other team members to include the captains.

Regional Competition Dates (REQUIRED):

LA North Regional. 3/2/23 - 3/5/23 San Francisco Regional: 3/16/23 - 3/19/23 Silicon Valley Regional: 4/5/23 - 4/8/23

World Championship (if we qualify) (REQUIRED): Houston 4/19/23 - 4/22/23

By signing the line below, I commit to attending all of the Regional Competitions for the 2022 Season, attending the World Championship (if we qualify), and spending many hours learning and practicing driving the robot especially near the end of Build Season.

Signature: _____

Date:



Appendix L: Outside of Class Activities

If the CC lead team desires to have an outside of class activity where they are representing the team (fundraising, networking, outreach), they must submit an Outside of Class Request Form (linked <u>here</u>). Please make a copy of the form and save it in this folder (<u>click here</u>).

If it is an outreach event that is not fundraising, it needs to be submitted to a CC meeting *at least* 2 weeks prior to the event. If it is a fundraising event (that will require ASB approval) it needs to be submitted to a CC meeting *at least* one month prior to the event. *Plan accordingly otherwise the excursion will not be accepted.*

Link this form on the CC agenda so the teachers can review it. All boxes in yellow must be filled out. See example of the form below.

Outside of Class Request Form

Instructions

You have view only privileges. Please make a copy and save it in this folder. You need to fill out all areas that are in yellow.

Please submit this to a cc meeting at least 2 weeks before the scheduled event.

If this is a Fundraising event, it needs to be submitted *at least* one month before the event at a CC meeting.

Link this form to a CC meeting agenda.

Please plan this accordingly otherwise this may (likely) get rejected!

Title of Event	
Date Hannening, List times as well	
Where? Location	
Lead Student(s)	
Reason. Why are we doing this?	
Is a mentor required? If so, do you have a mentor in mind?	
Is this a fundraising event? If so ASB approval will be needed.	

