

# **Team Handbook 2019**

*Vikings Robotics - FRC Team 2984*

<b>Overview</b>	<b>3</b>
History	3
Mission Statement	3
Community Outreach	4
Goals	4
<b>Groups</b>	<b>4</b>
Electrical/Software	4
Mechanical	6
Logistics	7
Communications	8
Drive	9
<b>Roles</b>	<b>9</b>
President	9
Group Lead	9
Mentor	10
<b>Membership</b>	<b>10</b>
Expectations - Agreement	10
Volunteering	11
Photography and Media	11
Attendance	11
Joining	11
Safety	12
Collaboration	12
Slack	12
Getting Started	12
Channels	13
Google Drive / Slack Integration	13
Google Drive	14
Travel / Competitions	14
La Jolla High School Guidelines	14
Meetings	14
Pre-Season	14
<b>Competitions</b>	<b>15</b>
Overview	15
Dress Code	16
Conference Dress Code	16



<b>Parents</b>	<b>16</b>
Expectations- Agreement	16
Communication	17
<b>Mentors</b>	<b>17</b>
<b>FAQ (Frequently Asked Questions)</b>	<b>18</b>

## Overview

Viking Robotics- FRC Team 2984 is the robotics team for La Jolla High School, located in La Jolla, CA. The team was established in 2009 in a family garage, then moved into the ceramics office at the high school and now resides in the newly renovated, 1000 sq. ft school Auto-Shop space. Each year, Vikings Robotics members participate in the FIRST Robotics Competition (FRC). FRC is an international robotics competition aimed at getting young people excited about Science, Technology, Engineering and Math (STEM).

Don't be fooled by our devotion to the competition, the team's goals are much more than the annual robot competition. Vikings Robotics members work year round to help their community and show people the importance of STEM and STEM education.

There is no prior experience necessary to become a member of Vikings Robotics. However, team members are expected to be willing to try new things and to support each other. Students who have graduated from Team 2984 have gone on to attend some of the nation's top engineering schools such as Cal Tech, MIT, UC Berkeley, and Cal Poly SLO.

## History

Our team has over a decade worth of experience in competing in FIRST Competitions, notable achievements include:

- Semifinalist 2018 San Diego Regional
- Winner 2011 Las Vegas Regional



## Mission Statement

Vikings Robotics support the building of real world skills, instilling an appreciation for STEM fields in our members as well as giving back to the community through our outreach programs with local schools and groups.

## Community Outreach

Our team has hundreds of volunteer hours logged with local elementary schools such as Bird Rock and La Jolla Elementary. We send volunteers to our local elementary school's FIRST Lego League, as well as outreach for our local Middle School. We strive with our local community to promote participation in robotics and inspire the next generation of scientists and engineers.

## Goals

- Learn
  - Learn about applied and computer science, mechanical and electrical engineering
  - Business and entrepreneurship techniques
  - Teamwork, and working with multiple teams.
- Do
  - Design and build robots in the annual FRC challenge
  - Build and operate a successful team
  - Train and compete in FRC competitions with and against other teams
- Teach
  - Volunteer at "sister schools" as ambassadors of our team to our community
  - Document and share our best practices with the FIRST community
  - Cooperate with other FRC teams to help them grow their capabilities

## Groups

The Team is divided into 5 work groups and during pre-season members are invited to try different groups depending on where their interests lie. Once the season begins in January members select a group where they choose to work and support the team. Below is a break down of the tasks required for each group.

## Electrical/Software

The Electrical/Software group is responsible for the electrical and software components of the team's robots.



Vikings Robotics- FRC Team 2984  
<http://ljrobotics.org>  
ljhsvikingrobotics@gmail.com

Electrical/software group responsibilities include:

- Software
  - Design
    - Analysis
      - Analyzing what needs to be done on the robot and creating github issues for these needs. Prototyping
        - Creating a rough sketch of the code that needs to be created.
    - Validation
      - Ensuring that the end design will perform as intended.
  - Development
    - Coding
      - Actually programming to fix the given issues on github.
    - Debugging
      - Looking for bugs in the program and removing them.
    - Source code management
      - Properly making use of the git version control software and its integration with github.
    - Tool selection
      - Environment
        - Setting up the new coding environment for the season (VSCode).
      - Language
        - Choosing which language to program in (Java).
      - Code management
        - Choosing which version control software to use (git).
    - Open source software selection
      - What code base will we use as the basis for our repository.
  - Testing
    - Plans
      - Planning out what exactly needs to be tested.
    - Unit
      - Creating unit tests for the code using the Junit library. Testing individual modules.
    - System
      - Testing the system as a whole.
  - Documentation
    - Requirements
      - Documenting what the robot needs to do to ensure proper operation.
    - Design
      - Documenting how all the software modules work together and how to edit these modules.
    - Build
      - Documenting how to build our code and how to deploy to the robot.
    - End user
      - Add usage documentation for the drive team.
- Electronics
  - Design
    - Platform selection



- Deciding what materials we are going to use to build our robot.
  - Layout
    - Deciding how electrical components and wires should be arranged on the robot, possibly through the use of a 2D or 3D model.
  - Customization
- Development
  - Assembly
    - Actually assembling the electronics on the robot.
- Test
  - Plans
    - Creating a list of required tests to ensure the electronics are functioning correctly.
  - Unit
    - Ensuring that individual components work before they are installed.
  - System
    - Ensuring that the electronics as a whole work as intended.
- Maintenance
  - Defect diagnosis
    - Having the drive team report problems back to us in order to fix them.
  - Repair
    - Repairing broken electronics to ensure everything functions correctly.
- Documentation
  - Requirements
    - Documenting required elements for the electronics of our robot.
  - Design
    - Documenting the layout and overall design for the electronics of our robot.
- Training
  - Electronics
    - Teaching the new members enough skills to contribute to the electronics of our robot.
  - Software
    - Teaching the new members how to program in Java and use our environment.

## Mechanical

The Mechanical group is responsible for the mechanical components of the team's robots.

Mechanical group responsibilities include:

- Design
  - Analysis
  - Creating Blueprints
- Test
  - Prototyping
  - Prototype evaluation
  -
- Development



- Manufacturing
- Assembling
- Quality Control
- Maintenance
  - Defect diagnosis
  - Repair

## Logistics

The Logistics group is responsible for the operational logistics of the team.

Logistics group responsibilities include:

- Finance
  - Purchasing Process
    - Group Lead requests item (Slack request with item, price, purpose, and purchase link)
    - Logistics confirms that item is budgeted
    - Mentor reviews, approves and makes purchase
    - Mentor submits reimbursement request to Club Sponsor
  - Budgeting
    - Analyze budget use to make a conservative estimate
    - Mentor review and approves
    - Submit to foundation
    - Confirm foundation approval or revise and resubmit
  - Accounting
    - Record all purchasing and fundraising transactions in WaveApp
  - Fundraising
    - Solicit family contributions
    - Family and community corporate sponsorships
    - FIRST funding partnerships
    - Grant proposals
  - Foundation relations
    - Budget approval
    - Expense reimbursement
    - Account tracking
    - Donation processing
    - Grant pre-approval
- Membership
  - Roster
    - Create and maintain team roster with name, email, parent info, active status, workshop access and training credentials
  - Agreements
    - Collect parent and student agreements from all members
  - Attendance logs
    - Maintain spreadsheet with attendance records
  - Community service
  - Volunteer coordination



- Create and maintain signup
  - Track and maintain participation (Slack and Google Sheets)
- Facilities
  - Inventory management
    - Maintain map of where things are in the workshop
    - Document high-value assets (mechanical heavy tools, PCs, motors, etc).
    - Periodic inventory review
- Activities
  - Team calendar
    - Maintain and publish official team calendar with all team activities
    - Email notification to parents of any calendar changes
  - Meetings
    - Agenda
    - Minutes
- Organization
  - FIRST
    - Team registration
    - Competition registration
    - Event registration
- First Aid
  - Treat
    - Use and maintain the stock of the First Aid kit
    - Stay with injured persons that are leaving until departure
  - Alert
    - Contact other team leads, and Emergency Contact

## Communications

The Communications group is responsible for team marketing and communications functions.

Communications group responsibilities include:

- Branding
  - Name-**Vikings Robotics**
  - Colors red and black
  - Logos
  - Taglines
- Website
  - Design
  - Content
  - Maintenance
- Marketing
  - Email list (alumni, sponsors, etc.)
  - Newsletter (Sent by season, pre-season build season, off season)
    - Recipients: Foundation, parents, current past and prospective sponsors, team members, alumni, alumni foundation, press, school administration,
  - Signage
  - Promotional items (stickers, buttons, etc)





- Press relations (Contact with outside world)
- Blog (Updated every weekend meeting)
- Uniforms (Shirts jackets, etc.)
- Events
  - Sponsor visits
  - Club day
  - Extra events we are invited to

## Drive

The Drive group has responsibility for operation of the team's robots and team participation in competitions.

- Analysis
  - Game strategy
  - Contingency planning
- Training
  - Skill development
  - Design feedback
- Competition
  - Gameplay
  - Scouting

## Roles

### President

The President is the senior-most officer of the team.

Responsibilities of the President include:

- Primary responsibility for the team's successful fulfillment of its mission.
- Establish and communicate achievable goals and communicate them effectively to the team.
- Plan, manage and coordinate the team activities of the Group Leads towards team goals.
- Demonstrate by example the spirit of FIRST, a commitment to the team's mission, and exemplary member behavior and work ethic.
- Represent the team responsibly and professionally in interactions with school staff, other teams, team parents, supporters, and members of the school community.
- Attend and supervise all team meetings.
- Obtain mentor assistance as needed to fulfill responsibilities.
- Take all appropriate steps to protect the safety and well-being of all team members.

### Group Lead

Group Leads are officers of the team, each with responsibility for the activities of one of the groups.



Responsibilities of the Group Leads include:

- Primary responsibility for their group's successful achievement of group goals.
- Work to maintain and enhance the expertise of themselves and their group's members in areas of knowledge relevant to their group's work.
- Provide accurate information and advice to President regarding group capabilities and status.
- Work collaboratively with other Group Leads to ensure achievement of team goals.
- Plan, manage and coordinate the activities of their group's members.
- Demonstrate by example the spirit of FIRST, a commitment to the team mission, and exemplary member behavior and work ethic.
- Obtain mentor assistance as needed to fulfill responsibilities.
- Take all appropriate steps to protect the safety and well-being of all group members.

## Mentor

Mentors are expected to be involved and are expected to show up for most Saturday meetings. Mentors are also expected to be cordial and work with students to help the team function successfully.

While no prior experience is required to be a mentor, the following skills will be used:

- Engineering
- Software development
- Leadership training
- Curriculum development
- Education
- Marketing
- Public Relations
- Project management
- Organizational development
- Fundraising
- Web design

## Membership

### Expectations - Agreement

Students are expected to read the Vikings Robotics handbook completely and then sign and return the student expectations agreement. These are the key items on the student expectations form:

1. Think rationally, make no effort to sabotage the team or to injure anyone, mentally or physically.
2. Make an effort to attend all meetings and be on time, please warn people of your absence if planned.
3. Keep our facilities, equipment and robots clean, organized and in working order.
4. Be a good person, be nice.
5. If you are the second person the season to report this rule to president of the club, you get free cookies.



6. Don't hold back, if you have any suggestions or ideas, express them
7. Have a sense of humor, the rest of us have one most of the time
8. Respect the school and Staff's property
9. Don't bring in stupid time wasters (Dabbing, planking, causing)
10. Strongly consider volunteering at our sister schools, and read the paragraph below
11. Use common sense and realize the dangers that are around you
12. Do not go into the Staff and Art room parts of the Auto Shop, unless given explicit permission.
13. When injured, almost injured or if anyone else is injured, inform the nearest team lead or mentor.
14. Members are expected to keep and maintain good grades (A,B, C (only 1)) in order to better represent the club and not have the club cause a student to fail or perform poorly. The regular season leaves students with very little time to complete homework compared to off-season, and we much rather see you succeed academically, then fail classes while spending multiple hours with us a day.

## Joining

Members are required to fill out and complete:

- Emergency Contact Form
- Safety Test
- Sign, date and return the parent and student expectations forms

All these forms are found on <http://ljrobotics.org/resources/>.

## Volunteering

Vikings Robotics supports the community and each team member is strongly encouraged to volunteer. As part of our effort we volunteer in the FLL robotics club at three “little sister” schools. Our “little sister” schools include: La Jolla Elementary School, Bird Rock Elementary School and Muirlands Middle School. These robotics clubs meet after school on various days of the week and two of these schools are within walking distance from LJHS. A sign up sheet for volunteer dates and times will be made available to team members on slack under the “volunteering” thread. We strongly recommend volunteering, as a great way to interest young people in Viking Robotics when they come to LJHS and to help in our community.

## Photography and Media

Members may decline to be included in photos, the team can make no promises on members being included in videos or pictures for the blog or for sponsors, or for individual members taking their own



Vikings Robotics- FRC Team 2984  
<http://ljrobotics.org>  
ljhsvikingrobotics@gmail.com

personal photos. We ask all members who don't want to be in photos to express this concern, mainly to communications, and that no one purposely infringe on their choice.

## Attendance

We are a team and every member depends on every other member in order to succeed. Attendance is very important. For this reason, we have the following rules regarding attendance:

- To ensure their readiness for competition, members must attend 80% of Saturday meetings during the pre-season in order to participate in the regular season.
- If you will miss a regular Saturday practice, volunteer day or other team event please let a group lead or other members know.
- People who do miss meetings can make up the requirement by doing volunteer hours at one of our sister schools.
- If you miss a meeting, the team has a blog found at <http://ljrobotics.org/blog/> which generally explains what was accomplished. If further information is needed please check on Slack or email us at [ljhsvikingrobotics@gmail.com](mailto:ljhsvikingrobotics@gmail.com)

## Safety

Safety is our highest priority and our goal is that no accidents or injuries occur during team activities. Maintaining a safe environment and a strong safety culture is the responsibility of all team members and Mentors.

- Team members are required to submit a completed [emergency contact form](#), know the information in the [team safety manual](#), and pass the [team safety test](#) before accessing the workshop.
- Team members are required to update their emergency contact information when changes occur.
- Safety rules must be followed at all times.
- Team members are not permitted to use any dangerous equipment without specific training and explicit permission of their group leader.
- All team members are responsible for reporting safety rule violations.
  - Team members should **immediately** report to an adult any event that puts a person in a dangerous situation.



# Slack

## Intro

Most interteam communication is done using Slack. Learning Slack is for your own benefit, not using it and it's simple UI will reduce your ability to communicate with the team.

Slack is both powerful and easy to learn. It is like a group text app where:

- there are multiple conversations ongoing about specific topics
- you can start, join and leave conversations.
- you can receive message notifications for the conversations you are in
- the Slack contacts list is automatically maintained and updated for you
- all conversations are archived and searchable for convenience and safety
- you can easily add and follow links to docs on the team's Google Drive
- there are lots of "add-ins" to Slack so it is getting new features all the time

## Getting Started

Go to <https://slack.com/signin> and use [ljobotics.slack.com](https://ljobotics.slack.com) as the workspace URL. You can only join by invitation.

Once a team member's student and parent membership agreement are received, an invitation will be sent to the student email address. (If you do not receive the invitation, please send an email to [ljhsvikingrobotics@gmail.com](mailto:ljhsvikingrobotics@gmail.com) to ask for an invitation.) Instructions for how to join and set up Slack on your devices once you receive the invitation can be found at "[Join a Slack workspace - Receive and Accept an Invitation](#)".

There are Slack apps for web browsers, iOS, and Android. You should install the app on your mobile device and **configure the Slack app to show notifications on your device in the same way as your text messages**. This will help ensure that you can follow and participate in conversations. You should also keep a Slack tab open in the web browser on your PC or Mac so you can receive notifications there as well.

There is a support chatbot named "slackbot" that is a member of our workspace. You can DM slackbot with question about how to use slack and it does a pretty good job with giving you the right answers. You can also find help in the [Slack Help Center](#).

## Channels

You can use Slack for direct messaging with team members but most of the activity occurs in group chats that are called "Channels." You can join and leave most channels though some are "locked" and you will need an invitation to join (contact #logistics with any issues). Channels are created and removed as

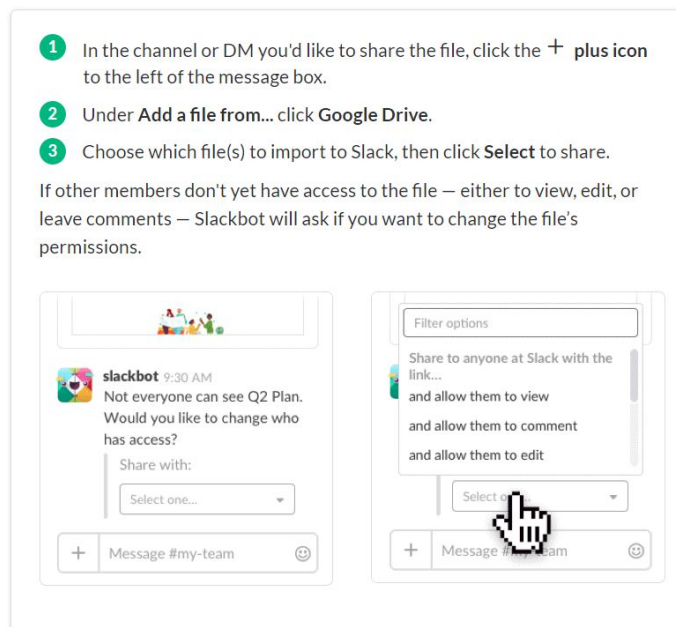


needed, but some important ones are described below. To Join a channel click on “Channels” on the left of your screen, to browse channels, once you are browsing channels, just click on one to join it.

- **#general:** General announcements and discussion relevant to the whole team. Important news will appear here!
- **#mechanical, #software-electrical, #communications #logistics, #drive:** Discussion of the activities of individual workgroups.
- **#purchasing:** Post here about things we need to buy. Please include as much detail as possible, including link to websites with technical details and price. All members are welcome to post things that we need here but you need a good reason to have it and approval from group leadership is required before we can buy it.
- **#fundraising:** Discussion of fundraising ideas, activities, and opportunities.
- **#volunteering:** Discussion of the community volunteering program and its activities.
- **#groupleads:** Discussion among group leaders.
- **#mentors:** Discussion among mentors.
- **#random:** Irrelevant blather on any topic but team rules apply.

## Google Drive / Slack Integration

Google Drive is integrated with Slack so that you can easily include links to shared files in your messages. Instructions for how to do this are given in [“Share a Google Drive file in Slack”](#) and shown below.



## Travel / Competitions

While carpools are available for competition, members are expected to make these arrangements themselves. Members are also necessary to help transport the robot to and from competitions. Two of the sister schools we volunteer with meet after school and are in walking distance from LJHS.



Vikings Robotics- FRC Team 2984  
<http://ljrobotics.org>  
ljhsvikingrobotics@gmail.com

# Seasons

## Pre-Season Meetings (Sept.-Dec.)

Fall pre-season is one of the most important parts of the year. 80% attendance is required during the pre-season in order to participate in the competition. This is the time where the team trains its new members, it is when people learn which group they want to join and how they will work. The preseason is necessary for learning about other team members, and is important for fundraising, as many grants or donations are done before the build season in January. Pre-season meetings take place on Saturdays from 10am-2pm and end in early December.

## Build Season Meetings (Jan.-Mar.)

Build season is when the team assembles the Robot. It is when the challenge is presented by FRC and we are given a limited amount of time to create a functioning robot that solves the challenge. Meetings are everyday after school until 6pm. On Saturdays we start at 10am and go till we are done. If you cannot be present this part of the season, you should reconsider whether or not you should join.

## Post Season Meetings (Mar.-June)

The Post-Season begins after the final competition until the last day of school. It is a time to reflect on what we did right and what we did wrong, we fundraise, make plans and get the new leadership ready. Some planning meetings and leadership training continue during the summer for group leads, as needed.

# Competitions

## Overview

The Regional competition spans three days, the first day acts as a preparation for teams allowing the teams to be inspected. We also get to have some practice matches. Usually we are allocated 3 matches but you can fill in for no-shows in other matches. The second day is for qualification matches in which teams compete to receive qualification points to reach the top 8 to have a seat in the finals or get noticed by another team and get picked to create an alliance for the finals. We usually have 6-8 qualification matches.



The third day is the finals in which the top teams choose two other teams to compete with in the finals. This is also the day we have the awards ceremony to finish off the season. The alliance that wins the regional gets to go to the national competition in Houston, TX.

### **Scouts / Strategists (6-12 Students)**

- Everybody will be a scout for some time except for Drive Team
- Take notes on other robots so that Drive Team can make strategies

### **Pit Crew / Pit Speakers (2-4 Students)**

- Members of the mechanical or Software, that are present for mainly maintenance.
- Understand what the robot does and how it does it. They need to be prepared to talk to judges
- Complete the robot checklist before every match

### **Safety Captain (1 Student)**

- Has to be in the pit **AT ALL TIMES**
- Make sure that the team is following safety protocols

### **Drive Team (3 Students)**

- Drive Team is selected during the pre-season, jobs here consist
  - Driver - Controls robot, communicates with operator for fine adjustments
  - Operator - Controls mechanisms on the robot i.e. arm, launcher, climber
  - Drive Coach - Tells Driver what their main goals are, formulates plan for each match
  - Human Player - Person who will interact with the Robot on the field, by giving or handling field elements.

### **Selection Process**

- **Scouts: Everyone not in Drive Team or Pit Crew**
- **Drive Team: Pre-Season**
- **Pit Crew: Team members needed by team leads in the pit**

## **Dress Code**

Jeans/Long Pants (Mandatory)  
Closed Toe Shoes (Mandatory)  
Team Shirt or Jacket (Suggested)

If you come in a Vikings costume you get bonus points (+5).

## **Conference Dress Code**

Please note, while we can't enforce that you follow dress-code we do encourage that you follow it.

**Jeans/Long Pants** (Heavily suggested for workshop and competition)  
**Closed Toed Shoes** (Mandatory for workshop and competition)  
**Team Shirt or Jacket** (Suggested for competition)



Vikings Robotics- FRC Team 2984  
<http://lrobotics.org>  
ljhsvikingrobotics@gmail.com



# Parents

## Expectations- Agreement

Vikings Robotics is a student-run academic team that designs and builds robots to compete in international events. We uphold the Core Values of FRC at all team events, whether held at school or outside of school. We display professionalism and honor the FRC philosophy of “Coopertition.”. We provide students with the opportunity to engage in self-directed learning of engineering, technology, and business skills with the support of peers and professional mentors from the community.

Below are the expectations listed on the Vikings Robotics Parent agreement. Each team member needs to return the signed parent agreement during the first weeks of practice.

1. Adult coaches and mentors ask questions and guide the team members, but it is the team members that do most of the planning and all of the work to find solutions.
2. Help assure your student be on time to practices and most importantly competitions.
3. Respect the team, its leaders and its sponsors.
4. Please bring concerns to the coaches. If you have any questions or concerns about the team or your student, please bring them to the attention of the coaches so they can be addressed.
5. We request that each family make a donation to Viking Robotics Team to cover costs for our entry fee(s), the robot and supplies. We recommend a donation of \$300, but any amount is helpful. You can make your donation now by credit card or check. Please go to this site for donation information:  
<http://ljrobotics.org/supporters/>

## Communication

Parents while allowed to attend competitions are preferred to stay in an observatory role and let the team compete.

We ask parents at the start of every season if they would like to be part of our parent email roster. This is a way for us to send messages to the parents such as meeting information, food delivery and competition information. If at any point a parent would like to have their email taken off or put on the roster they can email the team at [ljhsvikingrobotics@gmail.com](mailto:ljhsvikingrobotics@gmail.com).

Vikings robotics relies on generous donations from our sponsors as well as parents. Parents can also become mentors for the team donating valuable experience to help the team compete.



# Mentors

## School District Volunteer Clearance

In order to volunteer to work with students when a teacher is not present you must be registered and cleared by the district. This clearance is required for both parents and outside mentors.

The requirements and process are outlined on the district website at:

<https://www.sandiegounified.org/volunteer-program-guidelines>.

The clearance process is as follows:

1. Complete the most recent version of the volunteer forms from the district website.
  - Note that under the 2017-18 forms, the TB form does not need a doctor signature if you do not have any of the listed risk factors.
  - Since you will be attending meetings with students where no school staff are present, you will be a category D volunteer. You should indicate this on the form.
2. Take the completed volunteer forms to the front desk of the LJHS main office (usually Stacey or Rita) on Tues-Fri.
3. You may need to give the TB page to the school nurse (who doesn't come in on Mondays) and sit down with her to review the form.
4. The front desk will put the your volunteer applications forms in a binder.
5. You need to obtain a form from the office called "Request for Live Scan Service". The office staff will fill it out with you.
6. Take the request form to the "Live Scan" office at school district Central Office facility at 4100 Normal St. The "Live Scan" office hours change throughout the year so it is best to call them in advance at [\(619\) 725-8000](tel:6197258000) to confirm their hours.
7. The clearance should be processed and the LJHS office will be notified of your approval as a volunteer in 5-10 days.

## FAQ (Frequently Asked Questions)

### How much time do I have to spend?

If you want to be an official member of the team you must have at least an 80% attendance rate to all pre-season and regular season meetings. We also ask you attend team outings (i.e kickoff, competitions, etc). This is to ensure we don't have people that will come to meetings randomly and expect to be part of the team. You can make up missed meetings by volunteering at one of our sister schools.

### When are meetings?



Vikings Robotics- FRC Team 2984  
<http://ljrobotics.org>  
ljhsvikingrobotics@gmail.com

The team typically meets on Saturdays, 10am till 2pm. Except during the build season when we also meet every day after school. There is also planning meetings on Wednesdays during lunch in Mrs. Saddlers room. Check the team google calendar on the Viking Robotics website to get meeting updates and details.

## **Will I have fun?**

YES! Robotics is not just for nerds and we all have fun here in our little community and we make sure everyone is included and has a good time. The main goal is to build the actual robot but we also make sure we can have fun along the way.

## **Who wrote this and are they a robot?**

No actually! I'm a real human person named Marshall who steals credit for things other people wrote. He is not a robot however he is also not doing this out of free will.... In truth, this whole handbook was written collaboratively by team leadership and the only robot used was the computer.

