Friarbots Team Handbook

Basic Guide to 3309

About the Team

What is FIRST?

The Friarbots, FIRST Robotics Team 3309, compete in the FIRST Robotics Competition. FIRST is an acronym meaning “For Inspiration and Recognition of Science and Technology.”

The FIRST Robotics Competition is an exciting, multinational competition that teams professionals and young people to solve an engineering design problem in an intense and competitive way. The program is a life-changing, career-molding experience – and a lot of fun. The FIRST mission is to inspire young people to be science and technology leaders, by engaging them in exciting mentor-based programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership.

Two values essential to FIRST are Gracious Professionalism and Coopertition. Gracious Professionalism is part of the ethos of FIRST. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. Coopertition is displaying unqualified kindness and respect in the face of fierce competition. Coopertition is founded on the concept and a philosophy that teams can and should help and cooperate with each other even as they compete.

By competing in FIRST, you are part of an international organization made up of hundreds of thousands of students, mentors, and volunteers. You will have an opportunity to be part of something truly larger than life and have the 'hardest fun you'll ever have.'

Mission and Vision

Team 3309 aims to form capable leaders in STEM and other realms through participation in FIRST. Team members plan, design, build, and program a robot that will compete against others, gaining real, hands-on, technical engineering training, and developing skills in leadership, collaboration, communication, planning, fundraising, public relations, and more. Students leave Team 3309 inspired to pursue STEM in their careers and prepared to handle whatever demands are placed upon them in their education and careers.

Core Values

- We are a team
- We do the work to find the solutions with guidance from our coaches and mentors.
- We honor the spirit of friendly sportsmanship.
- What we discover is more important than what we win.
- We share our experiences with others.
- We display Gracious Professionalism™ in everything we do.
- We have fun!

Friarbots History

Team 3309 was founded in the fall of 2009, chartered by Servite High School. The team entered its first competition season in January of 2010. Initial funding came through the NASA grant for FIRST rookie teams, and support from Hamrock Inc. and several

corporations owned by Servite alumni. Since then, the Friarbots have more than doubled in size.

Highlights

- 2009 - Team Founded
- 2010 - Competed in "Breakaway" at the Los Angeles Regional in Long Beach, CA.
- 2011 - Competed in "Logomotion" at the Los Angeles Regional.
- 2011 - Expanded to become a Tri-School team with members from Connelly and Rosary
- 2011 - implemented all-new leadership structure for the team and established a year-round program
- 2012 - competed in "Rebound Rumble," finishing as semifinalists at the Los Angeles Regional and finalists at the Central Valley regional in Madera, CA
- 2012 - won the Entrepreneurship Award in Los Angeles

Who Can Join?

The team is open to all students currently attending Servite, Rosary, and Connelly high schools who have no outstanding academic or disciplinary concerns. See the Member Requirements section.

Yearly Schedule

Summer Season

Summer Season begins with the summer kickoff the 3rd week of June. The summer season is comprised of many activities that will be beneficial in the pre-build and build season. Weekly committee classes and/or meetings will be held in the summer, organized by their respective committee head. Meetings will involve the repair and improvement of our previous year's robots, the design and construction of new mechanisms, and fundraising and outreach efforts. No experience is required and classes and meetings are highly recommended to attend.

Pre-Season

Pre Season begins with the Fall Kickoff in mid September. During the Pre-Season, students are still active with the team, but the workload will be lighter. There will still be CAD and Programming classes and regular committee meetings, and the dates will be announced on a weekly basis. Each committee will meet an average of 2-3 meetings per month.

Build Season

This is like the "Hell Week" for football, except that in FIRST, it's spread out among six weeks. Six weeks may seem like a lot of time, but it truly isn't. In the beginning of January, there is an official kickoff, streamed worldwide, which explains the new challenge that each team must accomplish during the competition. The FIRST Kickoff for Los Angeles happens at USC the first weekend in January. All team members are encouraged to attend - it is required for all team leadership. At kickoff, we pick up our Kit of Parts (also known as KOP).

During these six weeks, teams construct a robot from scratch, going through all of the phases of building a robot. These include design, building, and programming. Build season can be challenging for many, but relax and enjoy it. Again, it may be just a month and a half, but before you know it, it's stop-build day.

Engineering committees meet an average of 4 times per week (three weekdays, and all day Saturday). Sunday meetings may be called if additional time is needed. Be prepared to stay late at night. Time management is crucial.

Stop build day, or Bag'n'tag day, is the evening in which each FIRST team around the globe literally puts its robot in a bag and puts a time seal on top. At the competition, inspectors will be looking for tampering with these seals and any tampering with the bag. After this day, work stops on the competition robot.

Team 3309 traditionally builds an identical practice bot during the build season to allow the team to continue to fine-tune programming and improve mechanisms that will be installed on the competition robot, within the withholding allowance. Work continues following Bag'n'tag day until competition, but the schedule is less strenuous and meetings are called as needed by committee chairs.

Competition Season

The Competition season starts the week after Stop Build day. Regional competitions around the country take place over six weeks. See the Competition Guide.

New Members

As a new member, you need to complete the following as soon as possible to join the team as an official member:

- Read the Team Handbook (hey, you already are!) and sign the Agreement Form
- Submit contact information for the team roster and mailing list
    - [Link to submission form]

- Sign up on STIMS (the Student-Team Information Management System)
    - Go https://my.usfirst.org/stims/
    - Enter our team number (3309) and your contact information
    - Make sure you select the option to complete the consent form electronically - we do not want to deal with paper consent forms.
- Order a team shirt
- Pay the Team Fee (see Financial Obligations)

After Joining

- Read the previous year's Chairman's Award essay and executive summaries
- Watch the previous year's Chairman's Award Video
- Read The New Cool by Neil Bascomb (several team copies are available to borrow)

Apprenticeship Program

After the Fall Kickoff meeting where students show their interest areas by signing up for committees, the apprenticeship program will begin. Students voluntarily agree to have a veteran team member as a partner to help them with basic knowledge and any questions. Ideally the veteran team member has an "apprentice" who is interested in the same focus areas on the team. The purpose of this program is to train the new members with skills that will be vital during the build season, especially in the engineering committees. As the veteran student works on the robot, in CAD, or on the code, the apprentice can ask the veteran student any questions he or she has unobtrusively. This is an effective way for students to quickly close the gap with what they know and don't know about a particular subject; the apprenticeship program is mainly for fall/pre-build season purposes, when the overall team focus is gaining knowledge and experience.

Member Requirements

Attendance

All members are required to attend 50% of meetings during the build season in order to be considered a member and be allowed to attend a FIRST Robotics Competition as a team member. If you are concerned about your ability to maintain attendance, please discuss your situation with Mr. O'Neill.

Rules

Team members must follow the rules of Team 3309. The basis of the rules is quite simple: be respectful of others and be safe. These rules cover any violations any team member may make and here are some examples. Playing Minecraft or other games is disrespectful of the time and work others are putting into building a successful robot. Thinking that your job is more important than others or that you contribute more than everyone else is disrespectful.

Juggling pieces of sheet metal is not safe. Using a jigsaw without safety goggles is not safe. During your time with the Friarbots, you will be instructed in proper safety practices for handling various equipment and materials, and you are expected to consistently follow these safe practices.

Additional Rules

- If a student leaves before a work session is over, he or she must spend AT LEAST 15 minutes cleaning up (or have permission to leave from an Admin or adult mentor).
- Students must be respectful to everyone (whether they are present or not).
- Horseplay and video games are not tolerated. If work for the day is complete, make sure your ride is coming and work on homework.
- All applicable rules of Servite, Rosary, and Connelly apply at any place where robotics work is being done.

A major source of distraction in the work area is the new iPads. If you are not using them for a robotics-related task, put them away and find something more useful to do. The same holds true for computers; if you are not actively engaged in a task that requires computer use, it should be put away. Most problems can be avoided simply by using common sense. Think before you act and you'll do just fine. However, if you fail to follow these rules, you will receive a JUG/detention. Repeated offenses may be subject to penalties up to and including removal from the team.

Committee Membership

All team members are members of at least one committee (see Committees). Team members are encouraged to sign up for two or more committees depending upon where their interests lie. Many team members find that they enjoy being a part of one engineering committee and one business committee so that they can truly experience different areas of the team's operation.

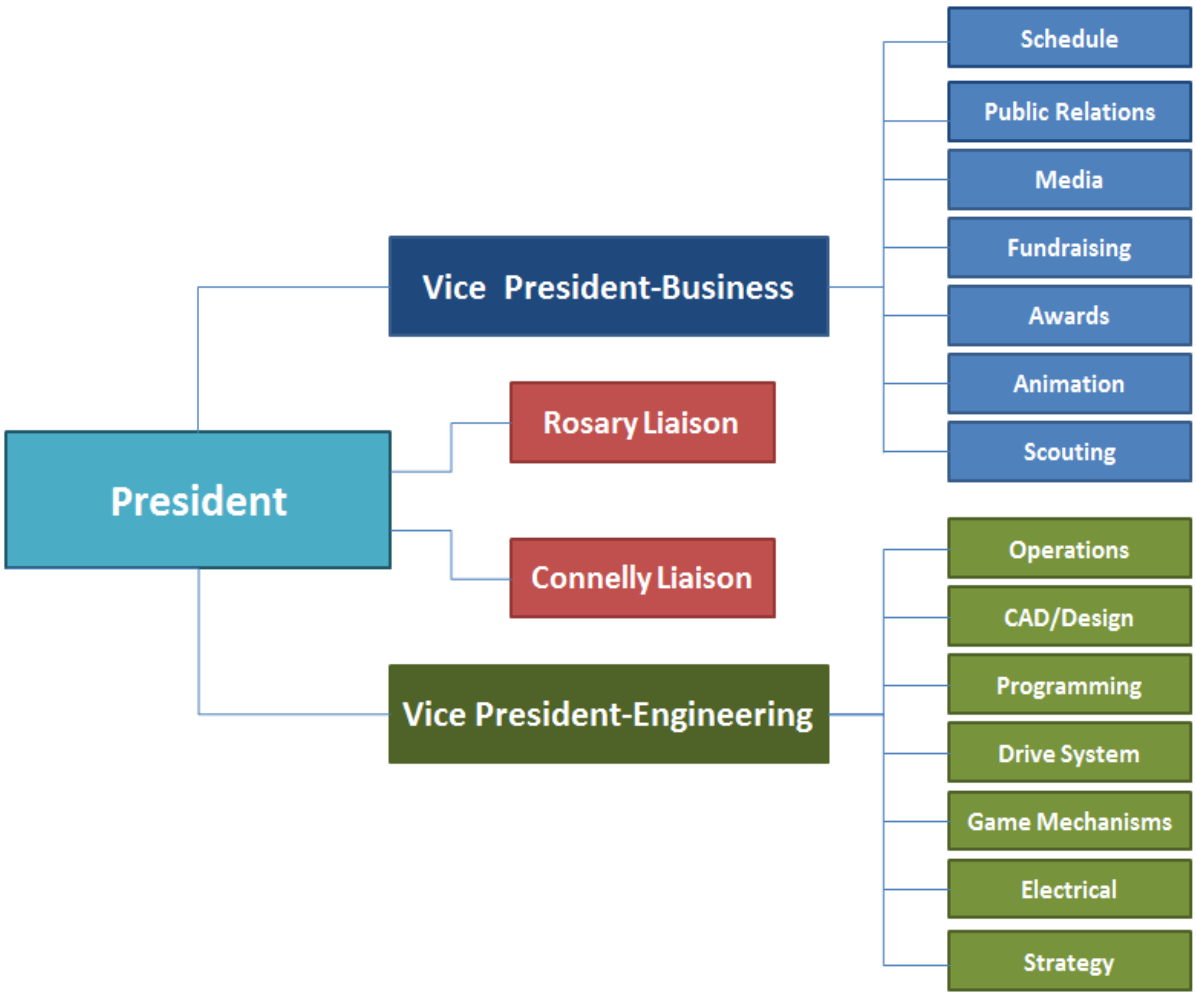
Varsity Requirements

The Friarbots award a varsity letter to exemplary members of the team. The criteria to letter are as follows:

- Be in 11th or 12th grade
- Attend at least 75% of all relevant meeting sessions (relevant is defined as pertaining to the committees or projects that the member is involved in)
- Attend 100% of mandatory team meetings
- Hold a position of leadership on the robotics team, which could include:
    - Admin

    - Committee Chair
    - Leadership and ownership in particular role
- Maintain at least a weighted 3.0 GPA
- Participate fully in at least two outreach events after school or on the weekend (examples include freshman orientation night, back-to-school night, middle school robotics workshop, Java beta test workshop, etc.)

Award-Winning Team Structure ™



Joining Committees

Committee signups occur at the Summer Kickoff and Fall Kickoff meetings. If you would like to change your committee membership status, please contact the Vice President that oversees the committee in question.

Committees

Project Coordination

The project coordination committee is responsible for maintaining the team's schedule of meetings, events, and facilities throughout the year. Committee members will use Google Calendar and Microsoft Project to lay out a schedule and communicate it to all team members. Members will work with all other members of leadership, Servite facilities faculty, and Mr. O'Neill to schedule meetings and events, avoid conflicts, and reserve facilities. The build season schedule (completed in Microsoft Project) is imperative to keep all committees on track during the build season and ensure that the process stays on schedule.

Public Relations

Public relations is the part of our team that interacts with the community. PR committee members are responsible for scheduling demonstrations and outreach events, creating press releases, fliers, and promotional materials, advertising events through various channels at Servite, Rosary, and Connelly, and ordering team shirts, banners, and "swag items" for the competition, among various other tasks.

Media

Media creates the public face of our team in print, in video, and on the web. Media committee members take juicy, visually nourishing photos and videos during team meetings and events, update and maintain the team website www.team3309.org, aid in production of the Chairman's award video along with the Awards committee, maintain the team email lists, and run the team's social network profiles on Facebook and Twitter.

Funding

Members of the funding committee gain experience raising and managing our yearly team budget of over $30,000. Funding members develop a fundraising presentation and promotional materials, give presentations to establish and maintain sponsor relationships, sell FIRST LED lightbulbs, and more. The funding committee manages the purchasing and expenditures of the team.

Awards

The Awards committee is responsible for applying for and preparing the team for various awards. The largest of these is the Chairman's award. Awards committee members write the Chairman's award essay and responses, plan and produce the Chairman's award video, and prepare materials for judges to observe at the competition. This committee involves a great deal of writing and creativity. The Awards committee should work closely with the Public Relations and Media committees to plan and document outreach events for the Chairman's award. The majority of the outreach events should be planned by the end of

September and executed in October so the essays and video will be produced by the Kickoff in January. The writing team for the essays should ideally consist of 3-4 team members so the essay sounds cohesive. Three members of the writing team will also be the members that give the presentation in the Chairman's award interview.

Animation

Each committee member must learn the bare fundamentals of making a film. They will have to learn how to animate and create 3D models on their computers. Each student will also have to work to compile the entire Animation. Each member will learn tons of information about Animating using software that many major companies use. We receive the prompt for the Safety Animation in late September, and the final ISO of the animation is due in early December.

Scouting

The committee is responsible for learning about other teams at the competition, collecting robot information, formulating a strategy in conjunction with alliance partners for each match in competition, and creating a pick list if we rank high enough to choose our own alliance. Scouting members take photos of robots, compile data, and must have a great working knowledge of game strategy and techniques.

Operations

The operations committee is responsible for maintaining the facilities and equipment of the team, and managing the construction and use of the practice field. Team members are responsible for maintaining inventory of parts, construction of field elements, managing supplies and recycling, and purchasing parts and equipment, and other integral team functions.

CAD

Before build season begins, committee members are expected to show up for lessons in Autodesk Inventor. Based on their skills with the software, members choose whether to attend beginner or advanced lessons. By kickoff, every member needs to have a general understanding of how to use the software. Committee members are expected to take part in the initial design process at the kickoff of build season. To ensure efficiency, members must work diligently and quickly to create the part they are assigned. Also, they must work in their respective groups when assigned to do so. Members are responsible for coming on time to most, if not all, meetings, especially during build season. CAD works in lockstep with the rest of the engineering committees. At the beginning of build season, CAD will have to collaborate with these committees ensure the creation of a feasible design. However, once the basic design is thought out, it is up to the CAD Committee to design and create each part of the robot. As parts of the robot start to be made, robot assembly can begin.

Programming

Committee Members are responsible for a majority of the robot's code, written in Java. Members are expected to be attentive during programing lessons and full team meetings. Members are also expected to collaborate and work on code together in their respective groups. In addition to all of this, members will be expected to enhance their skills by reading materials given to them. If there are any questions, members will be able to ask either the Programming Chairman or the Vice President of Engineering. The Programming Committee will be working closely with the rest of the engineering committees. In some regards, the amount of work that the programming committee can complete is based off of how fast the robot is built. While other committees are working on building the robot, programmers will be working on both a test robot to hone their skills and the "Dashboard", a GUI (Graphical User Interface) which displays all important information about the robot while it is being driven.

Drive System

Committee members are responsible for all systems for robot mobility. This includes drivetrain, transmissions and control systems. Considering that a robot that cannot move cannot play any aspect of the game, drive systems has considerable responsibility to ensure the robot competitiveness. Also, drive systems are the first to design, build and implement systems for the robot. Many sub systems rely on drive systems to lay down the foundation of the robot. With these considerations, drive systems require high standards of design and are some of the most complicated robot mechanisms that have to be competitive, reliable and built in a compressed time frame. This committee should lead the team in design, quality and timely completion.

Game Mechanisms

Since the game chances every year, the new robot will need new mechanisms to play. Thus this committee must be creative to create unique ideas and designs. They will follow a creative design processes, where brainstorming, idea generation and critical thinking will be nurtured to their full potential. Often solutions are unique, resulting the need of a lot of prototyping and investigating. Mechanisms will be built and revised all the way to the end of the build season and into the competition. Game mechanisms is all about creating the ultimate robot mechanisms that take a competitive robot to a winning robot.

Electrical

The electrical committee is responsible for all wiring and electrical connections on the robot. Team members learn electronics skills and follow FIRST and Team 3309 rules and best practices to wire the robot and connect systems. Electrical committee members are also involved with other projects like the driver station, charging station, and robot cart.

Strategy

Strategy is another creative committee that works with all the engineering committees. This committee's primary responsibility is to analyze the game and develop strategies to play the game. For example, in the 2010 season, we discovered too late the importance of picking up rings from the floor, and the value of researching what other teams are doing on YouTube; this committee is responsible for anticipating and eliminating such shortcomings. This committee organizes and participates in the design process for game mechanisms. With game mechanism, strategy works to develop possible solutions to the game. Strategy also investigates the work of other teams, reports findings to the team, and makes adjustments to strategies. During the competition, the committee continues to develop strategies for each match. The committee will also watch other robots and observe successful designs. These observations will be presented to the other committees for possible implementation. Thus the committee finds ways to win, developing the cleverest strategy.

Leadership

Requirements for All Leaders

- Being a team leader is a full time job. Robotics must take precedence over all other activities you are involved in. You must be 100% committed.
- You will be expected to lead a committee and execute tasks independently and seek out new opportunities. You will receive guidance from Mr. O'Neill, mentors, and the team leaders but it requires a high degree of independent thinking and leadership.
- You will be expected to attend numerous required leadership meetings outside of the regular meeting schedule.
- You will be expected to determine your committee's own meeting schedule and communicate this with the Vice President overseeing your committee, and the Scheduling lead.
- Your parent(s) must be approved Servite supervisors and be able to supervise individual meetings for your committee. If this is not feasible, please discuss this with Mr. O'Neill in advance.
- These job descriptions are just a baseline and will be modified and improved continuously as we enter each season.

Application Process

The leadership application process occurs every May. Interested team members submit their applications via email to info@serviterobotics.org, thoroughly answering all questions pertaining to the positions(s) they are applying for, which are distributed several weeks in advance of the due date. In some cases, applicants may be called in for an interview to answer any outstanding questions. Above all, your selection as a leader depends on your

passion and demonstration of past performance on the team.

The leadership appointments are decided by a committee consisting of the team admins (President and Vice Presidents) and Mr. O'Neill, with additional input from mentors. The leadership positions are announced at the year-end celebration in late May or early June.

Project Coordination Lead

This person will:

- Lead a group in charge of managing the schedule and project timeline for the entire team and all committees through a project management software such as Microsoft Project
- Manage rosters for all committees and the attendance taking system for the team
- Arrange school facilities for meetings and events in collaboration with Mrs. Ritchie and other faculty

Public Relations Lead

This person will:

- Be in charge of other PR Members and give them jobs to promote, connect, and develop a reputation for our team
- Advertise the team within the Tri-School community and arrange team presence at events such as Club Rush
- Work with other team leaders to design the team brand, including team shirts and souvenirs to hand out at the competition.
- Work with the Servite Communications Dept. to spread the Team's message and presence as well as details about events.
- Contact and interact with other teams during the build season
- Serve, along with the other members, as a spokesperson for the team both during the build season and during the competition
- Make sure that our team's reputation stays intact throughout transactions and interactions with other people and teams

Media Lead

This person will:

- Lead a group of students in updating and maintaining the team website
- Produce weekly videos, segments for Servite TV
- Update Twitter and Facebook regularly with updates and content
- Work with the Awards committee photos and videos of work sessions for use on the website and in other promotional materials.
- Maintain email lists, Twitter, and other forms of group communication for the team.

Funding Lead

This person will:

- Lead a group of students in writing applications for grants, pursuing corporate sponsorships, and work with parents and Servite advancement staff to organize fundraising efforts
- Facilitate team fundraising events and activities (i.e. recycling)
- Create presentations and business plans to explain the FIRST program and the team's financial status to potential sponsors and members of the community (this includes collaboration with PR on presentations).
- Organize and run LED light bulb fundraisers and many others year-round

Awards Lead

This person will:

- Make all team members knowledgeable about available awards from FIRST, and which ones we qualify for. Work with engineering committee chairs to assemble submissions for engineering awards
- Organize and execute applications, activities, and outreach that correspond to the awards our Team is pursuing
- Lead discussions and work sessions for award applications
- Act as a spokesperson for the team if the need arises that an application presentation is required, or if the team wins an award
- Follow through with all awards and decide which are most possible to do in the time frame available
- Understand that awards can be anticipated and worked on before the build season, and year-round

Animation Lead

This person will:

- Lead a group of students to design and produce a safety animation video for the FIRST Safety Animation Award.
- Use Autodesk 3D design software to create a 40 second long video that expresses important FIRST safety topics and a message and philosophy of safety on our team.
- Note: this position is over with in November when the animation is due

Scouting Lead

This person will:

- Lead a team that develops our own team scouting system, including data collection, photos, match observation, and photos
- Incorporate this data into an easily accessible computer-based system

- Meet alliances at the competition and gain information about their strengths and weaknesses
- Deliver data to the Strategy committee to assist in creating a strategy for each match
- Foster good relationships with other teams so that they know a lot about us and can select us as alliance partners for the final competition matches
- Formulate a pick list of teams at each competition we compete at

Operations Lead

This person will:

- Lead a team in charge of designing, building, maintaining, and storing the FRC practice field
- Manage the inventory and organization of all equipment, parts, tools, and machines in the pod and garage
- Manage the inventory database of specs, weight, and dimensions for all parts
- Research and order parts and equipment as required by the team

CAD Lead

This person will:

- Lead a team of students in designing models of designs for the robot and its mechanisms
- Work with our engineer mentors to make sure the design is easily manufactured within the given timeline and makes sense for the application on the robot.
- Allocate weight for each mechanism on the robot and carefully track weight of all components throughout the build process
- Eliminate design flaws early before production through a PDR and CDR

Programming Lead

This person will:

- Lead a committee of students to plan, sketch, and create a complete code for all functions of the robot
- Work closely with mentors and other committees to ensure proper communication about the functions of the robot that need backing code
- Be able to predict future functionality of the robot and control station, and work on ideas and code for these possibilities
- Work closely with Electronics committee members to create proper interaction between software and hardware
- Stay in touch with FIRST mandates, regulations, and rules about the control system and code, and fully understand the function of programming-related hardware on and off the robot.

Drive System Lead

This person will:

- Lead a group of students to plan for, design, and construct a sensible and usable drive system which is perfectly suited to our planned strategy in this year's challenge
- Work closely with other committees like Electrical, Programming, and CAD/Design to omit flaws and ensure proper function and construction
- Work closely with mentors and prepare complete information about designs and ideas for a CDR (critical design review)
- Clearly understand all of the rules and regulations regarding the drive system to ensure complete compliance
- Clearly understand the robot's function and strategy in this year's challenge and relate ideas to rules regarding the drive system

Game Mechanisms Lead

This person will:

- Lead a group of students to plan, design, and build all arms, lifts, and other mechanisms throughout the entire robot design
- Work closely with other committees like Electrical, Programming, and CAD/Design to omit flaws and ensure proper function and construction
- Work closely with mentors and prepare complete information about designs and ideas for a CDR (critical design review)
- Clearly understand all of the rules and regulations regarding arms, lifts, and how they will work inside the robot to ensure complete compliance
- Clearly understand the robot's function and strategy in this year's challenge and relate ideas to rules regarding the game mechanisms.

Electrical Lead

This person will:

- Lead a group of students in the electrical aspect of the robot, work closely with mentors, and work closely with other committee heads to ensure accurate and necessary correspondence and operation
- Study and understand the rules regulating all electrical aspects of the robot to ensure compliance and proper function
- Understand where electrical components are needed, or where they will be needed in the future, so that proper planning and accommodation can be made for all possible ability for the robot in the electrical aspect
- Work closely with programmers to insure proper hardware-software interfacing
- Guide his/her team to help with electrical projects both on and off of the robot, such as the driver station

Strategy Lead

This person will:

- Lead a group in charge of designing the strategy for our team to pursue
- Be responsible for knowing the entire FRC Game Manual inside and out with special focus on the game rules and strategy
- Constantly monitor the work of other teams on Chief Delphi and other channels for inspiration and validation, making tweaks to our team strategy as neccessary
- Monitor all regionals leading up to the events we are competing in to gain a competitive edge from the observations made
- Lead game simulations, walk through, and discussions
- Formulate a strategy for every match with our alliance partners, in conjunction with the information provided by the Scouting committee.

School Liaisons

- The school liaisons for Connelly and Rosary are the main contact points for robotics at the two schools
- Responsible for advertising the team and its activities and soliciting new members
- Responsible for distributing information to the entire school, as well as team-specific information to the members at each school
- Arrange robot demos, promotional events, and assist in planning and executing fundraising and other activities at each school.
- Serve as an intermediary for getting news items posted on the school websites, social media, and other publications

Meetings

Meeting frequency depends on what stage of the year we are in or what work has to be done (see Yearly Schedule). As we near the end of the build season and approach the competitions, the workload and meeting frequency tends to increase.

There are two types of meetings: Committee Meetings and Full Team Meetings. Committee Meetings have a specific goal unique to the committee you are a part of. Committee Meetings are usually small and very targeted. You will be contacted about Committee Meetings by the committee head. Full Team Meetings occur regularly throughout the build season and approximately once a month throughout the off season. Full Team Meetings are required for all team members and revolve around getting a lot of work done on the robot or handling team business and functions. At a Full Team Meeting you may need to work with your committee or on general tasks that involve everyone. Notifications about Full Team

Meetings will be given by the President. Food is provided at most Full Team Meetings; however, Committee Meetings usually leave you responsible for your own sustenance. Each meeting may have special circumstances regarding whether meals will be provided. Emails are sent weekly detailing the meeting schedule. The full schedule of meetings is available at www.team3309.org/calendar.

You are expected to work while at the meetings. If you are actively avoiding work or become a distraction to others working, you will be asked to leave. If you are having trouble finding work simply consult your committee chair. There is a whiteboard mounted in the Physics room that has a running list of all action items for each committee. If there is ever any ambiguity over what you should be doing, consulting your committee's action items is a perfect way to get back on track. If all else fails, observe someone that is working, while staying out of the way. Pick up on what they are doing or offer to find tools or supplies that they need. Ask questions about what they are doing so you can learn how to do this job on your own next time. Walking around and asking if people have jobs for you usually does not work.

Facilities & Restrooms

Committee Meetings take place in the Physics Room (703), 702, and 701. Your committee chair will indicate the location of the meeting, and it will also be noted on the calendar. Full Team Meetings take place in the Library.

Restrooms are available at the pool, the front of the campus, or inside the main building in the early afternoon. Using the staff restroom is prohibited. If a meeting continues late in the evening, the restrooms may be locked. If this is the case, simply ask for the set of keys from the President or Vice President who is overseeing the meeting, and use these at the restroom. If the restroom is locked when you arrive, please lock it when you leave.

Safety

Safety Training

Robotics is an activity where students regularly work with sharp metal and dangerous tools, and it can be very hazardous if proper techniques are not put into place. All members must listen to fellow team members so that they will act safely. Teachers and mentors always have the final word in any situation where safety is at stake. Team 3309 has a successful record of zero serious accidents or injuries and we aim to maintain this indefinitely.

Emergency Procedures

Emergencies and Injuries – Procedure

- **Check** – Check the scene. Is it safe? What happened? Who is injured? Is someone

there who can help you?

- **Call** – Find an adult mentor. Call 911. If an emergency occurs, the operator will need to know your name, location, telephone number, and description of emergency.
    - Address: 1952 W. La Palma, Anaheim, CA 92801. Closest entrance is through the dirt lot on N. Keystone Street.
- **Care** – After contacting emergency care and adult mentor(s), use the first aid tips and kit to care for the victim. Remember, the best thing you can do for someone who is severely injured is to help get an emergency care professional as fast as possible.

Safety Rules

- No student is ever to work without a supervisor on site.
- Any student intending to use any potentially dangerous tools must be trained about how to safely use the tool by an adult mentor.
- When finished using a tool, it must be returned to its designated location in the garage or pod.
- At the end of every work session, all tools and materials must be put away in the garage or pod.
- If a power tool malfunctions, it must be reported to a mentor immediately and must not be used until repaired or replaced.
- Electrical devices of any kind may NEVER be powered by daisy-chaining cords or power strips.
- Always wear safety glasses when operating or near somebody who is operating power equipment. If you are unsure in a given situation, wear safety glasses.
- No loose hair or long clothing is permitted during the use of power tools.

Financial Obligations

The Friarbots have an annual team fee that helps cover registration costs, parts, tools and equipment, and other expenses. Finances should not prevent anyone from joining the team. If you have any concerns about your ability to cover the team fee, please discuss your situation with Mr. O'Neill.

Donations to the team qualify for employer matching contributions the same way that donations to the school itself would. Many companies in the engineering and technology sector already have established relationships with FIRST for supporting teams, either providing financial support, in-kind donations, or donations based on volunteer hours, so please ask!

In addition to the team fee, there are other periodic expenses. Team members are required to purchase the official Friarbots polo (about $25) and the annual Friarbots T-Shirt (about

$15). Travel costs to regional competitions are expected to be covered by each individual.

Team meals are provided by parents on a rotating basis - you will be expected to provide one or more meals over the course of the year. See the Parent Guide for more details.

Parent Guide

Role of Parents

Parent support is an invaluable asset to our team. The Friarbots successes are due to the combined efforts of hard-working student participants, dedicated volunteer mentors, and very importantly, supportive parents.

Roles

- **Supervising** - At every work session or team meeting, a parent supervisor must be on duty, therefore, it is vital to the program that the team have many parents certified by Servite to supervise. Each team leader is required to have at least one certified supervisor parent (or receive an exemption from Mr. O'Neill). The role of a parent supervisor is to ensure the safety of all team members under their supervision. Registered supervisors sign up for specified days through VolunteerSpot.
- **Meal support-** Another role of parents is to help provide meals for the team. During the build season, team members stay as late as (or later than) 10PM several days per week, and they need food to keep going. Sign up to provide food through VolunteerSpot.
- **Acquisitions** - part and material acquisition is another important role. Parents who help with acquisition run errands to obtain merchandise, turn in their receipts, and receive reimbursement at the end of the build season.
- **Mentoring** - engineering mentors are not the only mentors in FIRST. If you have experience in any field related to any aspect of the team's efforts, we'd love your help!
- **Travel and Competition Support**- arranging logistics for 60+ people can be a daunting task. From setting up "home base" for fans, parents, and supporters outside of the main pit, to coordinating food, to hotel and transportation for the second regional, there is a huge amount to be done.

Becoming a Certified Volunteer

- Sign up through our parent coordinator - Denise Magro, denise@serviterobotics.org
- Complete Youth Protection Training

- Complete Fingerprinting and turn into the Servite office
- Sign up for designated dates for supervision and meals through VolunteerSpot
    - Note: supervision is required if your son or daughter is a member of the team leadership. If you have a specific situation, please discuss in advance with Mr. O'Neill
    - All families are expected to fulfill at least two meals during the year. If you have a specific situation, please discuss with Mrs. Magro

Permission and Consent Forms

Before taking part in any team activity, your son or daughter must have his or her permission packet turned in (please note: while these forms originate from the Servite office, they are suitable for team members from all three schools). In addition, the FIRST consent form must be completed electronically. When your son or daughter joins the team, he or she will register through STIMS, and enter your email as part of the process. You will receive a link to complete the consent form electronically.

Business Guide

Branding

Part of projecting a strong team image is consistent branding. Every team member is responsible for upholding the image and branding of Team 3309.

You may refer to the team in any of the following ways:

- FIRST Team 3309
- Friarbots
- FIRST Team 3309, the Friarbots
- Friarbots - FIRST Team 3309
- Team 3309 (only when in a FIRST context when FIRST is clearly implied)

You may **never** refer to the team as a club. The Friarbots **do not** identify as a club.

Always spell the name of our team as Friarbots, **never** FriarBots.

All videos are to be prefaced with the official Team 3309 video bumper, available from www.team3309.org/branding.

All official documents must use the official Friarbots letterhead, available from

www.team3309.org/branding.

Logos

In preparing documentation, fliers, videos, websites, etc. FIRST should always be mentioned. The FIRST logo is available from www.usfirst.org in versions for both light and dark backgrounds. Please use the appropriate one and follow all FIRST rules and regulations regarding the logo.

In preparing documentation, fliers, videos, websites, etc. you must always use the Friarbots logo. The Friarbots logo is available from www.team3309.org/branding in versions for both light and dark backgrounds. Please use the appropriate one and follow all accompanying directions.

Shirts and Other Proper Attire

Team 3309 has two official uniforms. The year-round uniform of Team 3309 consists of a Friarbots polo shirt and a team nametag whenever the wearer is at a public event. Uniforms must be worn at all off-season events and robot demonstrations. The competition uniform consists of the current year Friarbots T-Shirt (with sponsors printed on the rear). This shirt must be worn for all three days of any competition. Students should wear their team polo shirts on the school day before and after a robotics competition, to raise awareness at school.

During weekend build season and off season meetings, students may wear any current or previous team T-shirt or the Friarbots polo shirt. Wearing team apparel is important - it helps establish team unity and provide good shooting opportunities for photos and videos.

Sponsors

What are Sponsorships?

A sponsorship is a grant of financial, material, personnel, or manufacturing resources to the team. The ability of companies to support the team can change from year to year, so we must be constantly vigilant about seeking support.

Potential Sponsorships

All team members should be constantly aware of potential sponsors. If you have an idea, contact the Funding committee chair. Personal connections are far superior to “cold-calls” to potential sponsors.

How to Become a Sponsor

Potential Sponsors can fill out the sponsorship form, available at www.team3309.org/forms, which details the various benefits associated with different contribution levels and provides contribution and tax information. Sponsors will be advertised on the team website, banners, robots, shirts, and other publications, depending on the contribution level.

Outreach & Recruiting

On-Campus Demonstrations

On campus demonstrations are one of the major ways we spread awareness of our team and show off our robot. Demonstrations typically occur around Club Rush and prior to regional competitions.

Open House/Freshman Orientation

Freshman Open House is a December event when Servite opens its doors to the public for potential students to learn and experience Servite. This is an important opportunity to demonstrate the robot and advertise our team to potential members.

Freshman Orientation is an April Event when all incoming Freshman come to Servite to hear from administrators and program leaders.

First Lego League (FLL Teams)

One of the best channels to spread FIRST to the larger community is through the establishment of FLL (FIRST Lego League) teams at middle schools. Team 3309 is targeting four middle schools to establish teams at: John Marshall in Anaheim, Fairmont, St. Catherine, and St. Juliana. Each school is assigned a rep from our team that handles the program.

Middle School Workshop

The Middle School workshop is an annual Fall event where we invite students from middle schools (primarily those who feed into Servite, Rosary, and Connelly) to experience FIRST Robotics and what STEM has to offer. Separate student and parent rotations present different aspects of the program. This is an event that involves the vast majority of the team.

Java Beta Test Workshop

Team 3309 applies annually to be a Java Beta Test Team, which gives our team early access to new programming changes from FIRST, report any bugs or difficulties, and provide us with additional insight and experience. One requirement of being a Beta Test Team is to hold a

workshop for other teams in the local area to come and learn about the new changes.

Publicity

Demos

Demos are events hosted at schools or venues meant to spread the name and objectives of FIRST and Team 3309. Demos require preparation in order to properly "blow away" our audience. A robot is usually brought to a demo, either one from the last or current Robotics Season, along with play field elements to properly display the capabilities of the robot. Demos are heavily scripted in order to exemplify a more professional nature. However, do not let the scripting limit you from handling sudden changes. The specifics of each demo depend on when they are carried out and who our demographic is for that demo.

How to Respond to Questions

At demos and the robotics competitions you will be asked questions from a wide variety of people; from judges to potential members. Answer all questions with a confident and cheerful mentality. In meetings throughout the year, be sure to ask plenty of questions to those who know more than you. This way when you are approached and asked questions about our drive system, our robot's capabilities, or the team in general, you will be ready to answer any question with a detailed and proper answer. In the event that you do not know the answer to a question, simply apologize to the person and attempt to get the attention of a more knowledgeable team member who is not currently occupied.

Communications

Team website:	www.team3309.org
Team contact email:	info@serviterobotics.org
Mr. O'Neill - Faculty Mentor:	boneill@servitehs.org
Facebook:	www.facebook.com/friarbots
Twitter:	www.twitter.com/friarbots
YouTube:	www.youtube.com/friarbots

Communication Practices

Team 3309 utilizes a variety of communication methods to effectively distribute information. Daily checking of email is a requirement.

- Regular team news is delivered on a weekly basis through team-wide emails
- Committee news and assignments are delivered on-demand through committee

emails
- Public announcements are posted on the team Facebook and Twitter
- Public announcements with more details, and press releases, are posted on the team website

Group Email Lists

- Friarbots Community members@serviterobotics.org
  - Note: only approved senders may address the entire community
- Student Team Members students@serviterobotics.org
- Parents parents@serviterobotics.org
- Supervisors supervisors@serviterobotics.org
- Mentors mentors@serviterobotics.org
- Alumni alumni@serviterobotics.org
- Leadership leadership@serviterobotics.org
- Engineering Leaders engineering@serviterobotics.org
- Business Leaders business@serviterobotics.org
- Committees
  - CAD designs@serviterobotics.org
  - Drive Systems drive@serviterobotics.org
  - Media media@serviterobotics.org
  - Operations operations@serviterobotics.org
  - Programming programming@serviterobotics.org
  - Animation animation@serviterobotics.org
  - Awards awards@serviterobotics.org
  - Electrical electrical@serviterobotics.org
  - Funding fundraising@serviterobotics.org
  - Game Mechanisms gamemechanisms@serviterobotics.org
  - Public Relations publicrelations@serviterobotics.org
  - Project Coordination schedule@serviterobotics.org
  - Scouting scouting@serviterobotics.org
  - Strategy strategy@serviterobotics.org

Basic Skills Guide

Terminology

- Action Item
  - An active task assigned to a committee or individual with a defined objective and due date

- Admin
    - Team President and Vice Presidents
- Alliance
    - Three teams that work together during a match (assigned randomly during qualifications, and selected by the top eight teams and fixed in place during eliminations)
- Aluminium (Aluminum)
    - A strong lightweight metal. It is generally used for lightweight gear fabrication and plating. Hamrock Industries makes custom aluminum parts for the Friarbots, which allow for more customization on the robot
- Autonomous Mode
    - A mode used by robots usually during the beginning of a match. During this time, operators cannot touch the controls and all movement and actions have to be done in the code.
- C++
    - A powerful programming language used occasionally by the Friarbots. One of three supported languages in FIRST.
- CAD
    - Computer Aided Design is the format for designing and modeling the parts for the robot on a computer.
- CAN
    - Control Area Network for message-based communication of motors, one of two ways to control motors on the robot
- CIM Motors
    - A motor type typically used for FIRST drivetrains
- Code
    - Commands used to direct the robot to perform tasks. Usually measured in lines
- CRio
    - The 'core' of the robot. It is the central onboard computer on the robot, responsible for executing all control code and interfacing with all systems.
- Drivetrain
    - The mechanical systems on the robot that allow mobility
- FIRST
    - For Inspiration and Recognition of Science and Technology
- Gearbox
    - A gear configuration used to provide speed and torque conversions from a motor to a wheel or other mechanism
- Hybrid Mode
    - A mode similar to Autonomous Mode, also usually seen during the beginning of the match. During this time the robot is controlled by the operators through

a very specific method, such as signs, flags, or hand motions through Microsoft Kinect

- Jaguar
  - Speed controller for motors.
- Java
  - A programming language compatible with any operating system (Windows/Mac/Linux). It is the main language used to program the robot. Programmers use an IDE such as Eclipse to write code in Java.
- Juice
  - The adjective used to describe irresistibly attractive and high quality "juicy" photos and video produced by the Media committee.
- Mecanum Drive
  - A type of Omnidirectional Drive that offers flexible in-place maneuverability. It has less traction and pushing power than other drivetrains.
- Mecanum Wheels
  - Specialized wheel used for Mecanum drive.
- Omnidirectional Drive
  - A drivetrain that is able to move forward, backward, side to side, and spin
- Regional
  - A FIRST Competition consisting of 30 to 60 teams who compete in alliances
- Tank Drive
  - A traditional style drive system. It consists of 4 or 6 wheels that can move forward and back, and spin the robot. It functions like a real tank. Note - tank drive does not mean that the robot has tank treads.
- Teleop Mode
  - This is the mode used during the main part of the match. During teleop mode, the operators use a control board to move the robot how they want in order to score points.
- Wire Gauge
  - The measurement of a wire thickness

Engineering Skills

All Things FIRST

The Chief Delphi forums are your central source for discussion and knowledge about all things FIRST. Occasionally some threads can get politically charged because of all the passion that students, mentors, coaches, and supporters have for FIRST, but there is a treasure trove of information. Learn how to search, and especially pay close attention to Chief Delphi during the build season and the first weeks of competition to see what other teams are doing, what's working, and what isn't. **Important:** before posting on Chief Delphi

as a member of Team 3309, please consult with an Admin (Vice President or President).

Basic Programming

Team 3309 uses Java, one of three supported FIRST programming languages. The recommended programming resource is Sams - Teach Yourself Java in 24 Hours, available at Amazon and other booksellers. Countless tutorials for Java are available on the Internet. The programming guide, or "cookbook," from FIRST are the place to begin in understanding the FIRST code structure.

CAD References

Team 3309 uses the latest version of Autodesk Inventor for CAD work, available for free to FIRST students and mentors from the Autodesk academic website. The best way to learn Inventor is through the free video tutorials from Autodesk.

Animation References

Team 3309 uses the latest version of Autodesk 3ds Max for animation work, available for free to FIRST students and mentors from the Autodesk academic website. The best way to learn Inventor is through the free video tutorials from Autodesk, available here.

Game Strategy

The most effective way to learn and hone your skills in FIRST game strategy is to review previous year's competition rules, simulate the process of developing a strategy, and then compare your results to the methods used by the top teams in FIRST.

2012 - Rebound Rumble
2011 - Logomotion
2010 - Breakway

[Put in links to Game Rules, Game Animation, and footage from Championship matches]

Business Skills

Electronic Collaboration

Team 3309 uses two primary methods of electronic collaboration. **Google Drive & Google Docs**, set up through your @servitehs.org, @serviterobotics.org, or personal Gmail account, is used for collaborating on documents, spreadsheets, meeting notes, brainstorming sessions, and more. Team members are encouraged to use Google Forms whenever a signup, registration, or other information collection needs to take place. If you need help using Google Docs, ask a veteran team member for help.

ownCloud is the team's private file sharing system. Just like Dropbox, it can be used through a website, cloud.team3309.org, and through the desktop or mobile apps. Unlike Dropbox, we have "unlimited" storage, for no extra cost. To get an account, send an email to the Media chair.

After you get your account:

- Change your password to a one of your choosing by visiting cloud.team3309.org, clicking the 'Settings' icon in the bottom left corner, clicking 'Personal,' and then entering a new password.
- Set up Desktop sync
    - Download the client software from http://owncloud.org/sync-clients/
    - Run the installer
    - The installer will tell you to configure a new server. Enter in cloud.team3309.org for the server, and your username and password.
    - **Important:** to access shared files, you need to make ownCloud sync with your root directory, not the 'clientsync' folder that it uses by default. So you need to do the following: double-click on the ownCloud icon in the system tray. In the window that appears, select the ownCloud entry on the left, then click Remove. Click Add sync, Next, then Finish.

The shared files will now appear in your ownCloud folder. To access your ownCloud folder, browse to your users folder in Windows and then open the ownCloud folder. You can also right click on ownCloud in your system tray and click "open folder ownCloud."

Competition Guide

The Experience

The FIRST Competition experience is something that is incomparable to other events. FIRST Regional Competitions occur over three days, Thursday through Saturday.

Thursday is the setup day, where teams set up their pits, work on upgrades, replacements, and testing their robots, and begin scouting. Practice matches are held on the competition field, and a practice field is available to teams.

The competition takes place on Friday and Saturday. It consists of two parts, qualifying (all day Friday and half of Saturday) and elimination (second half of Saturday). All teams participate in the qualifying rounds.

Each match consists of 6 teams, 3 to each alliance. The 2 alliances are red and blue. These teams are randomly picked by FIRST and posted the morning of the competition. There will be points awarded in different categories. The two categories that will always apply each year are teleop and autonomous points. Sometimes, there will be a third category for special points awarded in an endgame procedure, such as balance points in the 2012 game of Rebound Rumble.

After the qualification matches, elimination team pairing will commence. The top 8 ranked teams in the qualification round will go through 2 rounds of team picks. The 8 newly formed alliances will then participate in a tournament style elimination. The two recognized competing teams at the end of the tournament are the Regional Champions (1st Place) and Finalists (2nd Place). Regional Winners proceed to the championship in St. Louis.

Awards are split up between Friday and Saturday evening. Teams who win awards proceed down to the field from the stands to receive awards. The Chairmans' Award is given on Saturday. Winning awards in FIRST is at least as important as your robot doing well, and the Chairman's award is the most prestigious of them all. For a list of all awards with detailed information, see usfirst.org.

Team members should be familiar with the following dances to fully participate in the competition experience: Cupid Shuffle, Cha Cha Slide, Macarena, YMCA, Gangnam Style.

Committee Involvement

Pit Crew - a select group of engineering committee members (typically around 5 students) that run pit operations. This includes repairs and upgrades to the robot, testing and troubleshooting between matches, and organization of equipment and tools. Unlike other committees that function year-round, the Pit Crew is selected specifically for a regional competition.

Drive Team - a select pair of team members (plus one backup pair) who are responsible for driving the robot in competition, bringing it on and off the field, working with the strategy committee to formulate a plan for each match, and collaborating with alliance partners for each match. The Drive Team is lead by a coach, usually a mentor.

Strategy - the strategy committee works with the drivers to generate a cohesive strategy for each match, based on an in-depth understanding of game strategy, information from the scouting team, and observation of previous weeks' regionals and the current gameplay.

Scouting - the scouting committee gathers a great depth and breadth of data on all teams at the competition, including robot photos, strengths and weaknesses, notes and observations

from each robot and each match, and delivers this to the strategy team and drivers. This information is used to generate a pick list if necessary.

Media - the media committee spends the competition taking photos and videos of the team and the robot in the pit, in the stands, and on the field, posting social network updates instantaneously, and uploading media each night and throughout the day as feasible. Pending feasibility testing, the media committee will also record each match and provide the footage for instant viewing by the drivers and strategy committee.

Awards - the three-person chairman's award team presents the chairman's award to the judge panel. Other awards reps talk to judges who browse the pits in search of Entrepreneurship, Engineering Inspiration, and other awards.

Other Committees - in the off-chance that a student is not part of one of these committees, they are encouraged to help with organizing logistics, or join one of the active committees.

Advertising

The competitions are heavily promoted on campus through announcements, on campus demos, Servite TV episodes, and potential extra credit offers from faculty. The competitions are also promoted online through the Servite, Rosary, and Connelly websites, Facebook pages, and Twitter accounts.

Each team member should take a special effort to encourage friends and faculty to attend on Saturday at the competition.

Prerequisites to Attend

In order to attend the competition on Thursday and Friday, and receive an excused school activity absence, team members must meet the following requirements.

- 50% attendance at all meetings
- Appropriate team attire purchased
- Team fees paid in full
- No outstanding academic or disciplinary issues
- All school work and tests completed in advance, or arrangements made to complete at a different date.

Travel Info

Team 3309 attends the Los Angeles Regional at the Long Beach Convention Center, and a second regional competition selected each year.

All team members who are able are encouraged to attend the regionals. Travel costs and transportation are the responsibility of each individual student. For the second regional, which involves overnight stays, team meals are traditionally arranged as a group and are included with the fees due for the trip.

All Servite/Connelly/Rosary rules and team rules are in full force at all competitions and events. Students represent the schools and Team 3309 at all times and are expected to act accordingly.

Detailed information on Regional Competitions is distributed via email and handouts well in advance of each event.

Authority of the Handbook

The rules and policies set forth in this handbook are binding and must be followed by all team members. The team leadership has the authority to modify the handbook at any time; the team will be notified of any modifications.

Contract

By signing below I acknowledge and understand all points listed below.

Students:

- I have read the handbook describing Team 3309 and agree to comply with the policies outlined within.
- Participation on the team requires attendance at meetings and I understand the yearly structure of these meetings
- I will be responsible to arrange my own transportation to robotics events.
- The equipment used during construction of the robot can cause serious harm and injury if not used correctly. Students are not permitted to use any piece of equipment until they have been instructed on its safe use and are not permitted to use any piece of power equipment without adult supervision.
- I will only ride a car driven by a teacher, a Servite-approved parent or mentor, or myself to any robotics function
- I agree and consent to allow my photographs, name or comments to appear in media related to Team 3309
- I understand that violation of any of the policies above is punishable by the leadership team up to and including dismissal from the team.

Parents:

- I have read the Parents Guide and am familiar with the rest of the Team Handbook
- I agree to supervise sessions if my son or daughter is a member of team leadership
- I agree to help provide meals for the team

Student Name	Student ID#
Student Email	Student Phone
Parent Email	Parent Phone
Student Signature	
Parent Name	
Parent Signature	