The Hitchhikers Guide To Robotics

FIRST Robotics Competition Team 2059 2017-2018 Student/Parent Handbook

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# Section 1: Introduction

## 1.1 What is *FIRST*?

*FIRST (***F**or **I**nspiration and **R**ecognition of **S**cience and **T**echnology) was founded in 1989 by inventor Dean Kamen. The international organization was created to inspire young people's interest and participation in science and technology. Its various programs aim to motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills. In *FIRST*, students develop technical, teamwork, and leadership skills and are encouraged to practice **Gracious ProfessionalismⓇ** and **CoopertitionⓇ**, good sportsmanship in the midst of competition.

The *FIRST* program has four different program levels: Jr. *FIRST* LEGO League (Jr. FLL) for students 6-9 years old, *FIRST* LEGO League (FLL) for students 4th-8th grade, *FIRST* Tech Challenge (FTC) for 7-12th grade students, and the *FIRST* Robotics Competition (FRC) for students 9-12th grade.

The Hitchhikers is involved with the FRC program for high school students. Every January, FRC teams tune in to a *FIRST* broadcast that reveals the year’s game challenge. Following the announcement, every team has six-and-a-half weeks to strategize, design, build, program, and test a robot to play that particular game. In addition to building robots, students learn to communicate their passion for science and technology through community outreach events, raise funds to support building the robot, and manage a budget. The FRC program caters to a wide variety of interest from mechanical engineering to programming to business and marketing.

For more information on *FIRST* and FRC, visit: [firstinspires.org](http://www.firstinspires.org/)

## 1.2 Who are The Hitchhikers?

The Hitchhikers is a high school *FIRST* Robotics Competition (FRC) team located in Apex, North Carolina. Though we are affiliated with Athens Drive High School in Raleigh, we are a community-based team. We have students from all over Wake County, representing multiple different schools including Apex, Green Hope, Middle Creek, Enloe, Southeast Raleigh Magnet, and several homeschools.

Founded in 2011, The Hitchhikers created its theme off of Douglas Adams’ *The Hitchhiker’s Guide to the Galaxy*. Though not required, students are strongly encouraged to read at least the first book in *The Hitchhiker’s Guide to the Galaxy* series. All of our marketing, branding, and team references will make a lot more sense to a student who has read the books.

We are also a 501(c)3 non-profit organization, meaning we are tax exempt.

Mission Statement - To provide a unique hands-on STEM experience for our community by spreading the word of *FIRST* and promoting the ideals of our team: impacting our community with STEM, training students in technological and business skills, implementing those skills in school and future careers, and leading groups of people and professional projects.

Motto - “Don’t Panic!”

# Section 2: Team Structure

## 2.1 Brief Overview

The Hitchhikers were founded with a strong belief in student leadership and we pride ourselves in allowing the students to take responsibility and lead the efforts of our team. The leadership structure we have in place not only allows our team to operate like a real business and have an effective communication chain in place, but also gives students experience to lead in a safe learning environment. All student leaders are expected to set a good leadership example and work together.

We have two Co-captains who oversee all of the different components of the team from the mechanical and programming projects to the marketing and business projects. Under the Co-captains are the Team Leads: the Robot (Build) Lead and the Business Lead. Team Leads oversee the sub-teams under their specified area--robot and business. Under the Team Leads are the Sub-Team Leads, who oversee the efforts of their specified sub-teams. Two smaller positions that do not exactly fit under our main areas are the Safety Captain and the Scouting Lead.

## 2.2 Role of Co-captains

A Co-captain is the highest leadership position on the team. Their primary role is overseeing all aspects of the team. Their responsibilities are:

* Overseeing all aspects of the team
* Keeping the team on schedule
* Leading meetings
* Updating the Hitchhiker Calendar and Schedule
* Sending emails out about upcoming events, outreach, and competitions
* Working with the Team Leads and Sub-Team Leads
* Informing the coaches of progress, setbacks, and issues

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## 2.3 Role of Team Leads & Sub-Team Leads

Under the Co-captains are the Team Leads. Their primary role is overseeing the sub-teams under a specified area. Their responsibilities are:

* Overseeing the sub-teams under a specified area
* Keeping their sub-teams on track
* Informing the Co-captains about any progress, setbacks, or needs

The Sub-Team Leads report to the Team Leads. A Sub-Team Lead’s main role is to oversee their area. Their responsibilities are:

* Overseeing their sub-team
* Working with the other Sub-Team Leads
* Informing their Team Leads of any progress, setbacks, or needs

## 2.4 Mentors

The Hitchhikers recognize the need for effective adult supervision, advice, and mentoring. Our adult mentors are very passionate about their profession, and they are more than willing to share their professional expertise and experience with us. We have several mentors--from engineers to programmers to business advisors--who advise us as we strive to achieve our collective goals.

## 2.5 Sub-Teams

To split up the tasks on our team, we have several sub-teams who each focus on specific needs of the team. We expect all sub-teams to work together, not as silos, to accomplish the collective goals of our team. No sub-team is above another sub-team.

Robot:

* ***CAD Team*** -- Responsible for creating robot parts and models in CAD, helping any team efforts requiring CAD, and documenting efforts for future reference.
* ***Mechanical/Build Team*** -- Responsible for fabricating and assembling the robot for competition, helping any team efforts requiring mechanical assistance, and documenting efforts for future reference. They also test and troubleshoot the robot with the Drive Team.
* ***Electrical Team*** -- Responsible for wiring the robot for competition, helping any team efforts requiring wiring, and documenting efforts for future reference.
* ***Programming Team*** -- Responsible for programming the robot for competition, helping any team efforts requiring programming, and documenting and maintaining programs for future reference. They also test and troubleshoot the robot with the Drive Team.

Business:

* ***Outreach & Media Team*** -- Responsible for keeping our social media & website functioning and current. This includes posting blog updates throughout the build and competition season. They also organize outreach efforts and are in charge of making videos, including the Chairman’s video, during the year.
* ***Spirit & Marketing Team*** -- Responsible for creating/maintaining consistent imagery and team identity. They are in charge of leading cheers at competitions and creating unique things to give out or have for the team throughout season consistent with *The Hitchhiker’s Guide to The Galaxy* theme and team’s branding standards. This Sub-Team is also usually responsible for creating a t-shirt design for that year consistent with our marketing/branding standards.
* ***Fundraising & Entrepreneurship Team*** -- Responsible for fundraising, maintaining relationships with sponsors (e.g. sending them regular updates on our team), making a business plan, budgeting, and bill of materials. They are also responsible for writing up and submitting awards such as the Chairman’s Award.

Other:

Two other roles that do not exactly fit into our two main areas are the Safety Captain and the Scouting Lead.

* ***Safety Captain*** -- Responsible for working with the Co-captains to ensure safe practices throughout the season and keeping the material safety data sheet up to date. During competitions, they will have to take part in the Safety meeting, talk to the judges about our safety program, and make sure our pit is clean, safe, and ready to show the judges.
* ***Scouting Lead*** -- Scouting is how we get individual data on how each robot is performing throughout the competition. It is extremely important for Alliance Selections and strategy. The Scouting Lead is responsible for creating the scouting form used to record a robot’s performance during a match, assigning scouting shifts, providing competitor information to the Drive Team throughout the competition, and talking to other teams about Alliance Selections. This role is usually held by a Co-captain and can be considered a Co-captain responsibility. This position may be delegated; however, a Co-captain must still be the Team Representative for Alliance Selections.

# Section 3: Team Procedures

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## 3.1 Team Member Requirements

New Members:

A student looking to join our team may join at any time provided there is a slot open. To be on the team, you must complete the necessary forms and turn them in on (or before) the date specified each year. Students must also keep up with their school work, commit to actively participate on our team, and follow our Code of Conduct.

Returning Members:

Returning students are held to a higher standard. To remain on the team, they must show leadership and growth from the previous season. Their participation in prior seasons will also be considered.

## 3.2 Selecting Co-captains, Team Leads, & Sub-Team Leads

Co-captains and leads have a big responsibility to oversee and lead the team. These positions must be earned.

Selection Process:

After each season, the current Co-captains will select--with the guidance of the mentors--new Co-captains to take responsibility of managing the team. This decision will be finalized and announced to the team by the end of May of that year.

After that decision has been announced, the new Co-captains will choose their leads and announce their decision by June 16th of that year.

The new student leadership team will officially take over immediately after the End-of-the-Season Party or an announcement email is sent out from the

previous Co-captains.

Leadership Rules/Requirements:

Co-captains, Team Leads, and Sub-Team Leads will be chosen based on the following requirements.

* A leadership position demands a lot of time and commitment. All student leaders must have the necessary time and commitment to fulfill their duties and keep up with their school work and other activities.
* All student leaders must have a good understanding of how our team operates and what we stand for.
* All student leaders must demonstrate a good understanding of *FIRST* and its values. *FIRST* is not just about the robots, though it is a huge part of the program. Business components also play a significant role in *FIRST*.
* All student leaders must help with business when asked.
* All student leaders must have been with our team for a year.

If a candidate for a leadership role is found lacking in any of these areas, then they cannot be a Co-captain or a lead. All leadership positions may be held for up to two years.

Exceptions:

If there are no qualified candidates, a student may hold a leadership role for more than two years. Likewise, a student who has been with the team for less than a year may be chosen as a leader if there is no one, who has been on the team longer, qualified to be in that leadership position.

## 3.3 Selecting a Drive Team

The Drive Team usually consists of four students: the Drive Coach, two

drivers, and the Human Player. They are responsible for driving our robot during competitions and following the Drive Team Contract. While all team members are held to a high standard, the Drive Team is held to an even higher standard. The Drive Team members are huge representatives of our team because they have the most contact with other teams and their conduct is extremely visible during a match. For this reason, a violation of the Drive Team Contract may result in the student’s removal from the Drive Team by the Co-captains. The Drive Team’s responsibilities are:

* Following the Drive Team Contract
* Driving the robot during competitions
* Working with alliance members to develop a strategy for that match
* Communicating with the Scouting Lead/Co-captain regarding competitor information
* Communicating with the team about robot performance and issues

Selection:

Sometime in November or December, the Drive Team will be selected via tryouts. Any student may try out for the Drive Team. A student chosen to be on the Drive Team should do their best to make it to all of our competitions.

After Kickoff, the Drive Team must take and pass a quiz on that year’s game. This is to ensure that they understand the rules of the game and what is allowed.

## 3.4 Selecting the Pit Crew

The Pit Crew is responsible for maintaining and repairing our robot at

competitions, keeping the pit area clean and ready for inspection, and taking

the lead in assembling and breaking down the pit. They also have the responsibility to represent our team and talk to the judges when they come

by.

The Pit Crew will be selected from those who know the robot the best and who best represent our team before our first competition of the season.

## 3.5 Discipline

The Hitchhikers will not tolerate inappropriate behavior including bullying, dishonesty, disrespecting fellow teammates or mentors, and not following our Code of Conduct and Handbook. A student exhibiting inappropriate behavior will be given a warning regarding their conduct from their Co-captains or mentors. Their parents will also be notified. If inappropriate behavior continues, the student will be given a second warning. A third infraction will result in the student being dismissed from the team.

# Section 4: GitHub

The team GitHub is the central location where all team programming projects shall be stored. The GitHub group team2059 contains code for robotics programming, scouting, the website, and more. It is a shared resource for the entire team. All repositories are viewable to any team member with an account. In order to get invited to a group, one must first

create a GitHub account and then ask an Organization Owner to be added.

## 4.1 Organization Owners

The coaches, programming mentors, and current Co-captains must be group owners. Optionally, the current Programming Lead can be added as a group owner. These roles will be updated following the announcement of the new leads.

## 4.2 Repository Ownership

Any team member may create a repository for any team related projects they are working on. The repository creator is also the owner of that repository and can set the rules for how that repository is managed. No team member should make changes to repositories that they do not own or have permission to change. Changes include pushing to the master branch, editing the wiki, or any admin level permissions. Forking a repository or pushing to a newly created branch is allowed. The creator of a branch is owned by both the repository owner as well as the branch creator.

## 4.3 Organizations Groups

Group organization can be created to help manage group permissions. The programming team will have a new group created each year that will have admin permissions for that year’s robot repository. There will also be a robot programming group that will have admin permissions to all robot code repositories. The current robot programing group will be a subgroup of this robot programming group so that they can change the code of old robots if needed.

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# Section 5: Team Expectations

## 5.1 Academics

School is important. We understand how much fun building robots and outreach events can be, but school takes precedence. We expect each of our students to keep up with their academic work. Any student struggling to keep up with their school work is encouraged to contact our mentors for assistance. Failure to seek help and keep up with school work may result in the student being placed on temporary leave from the team.

## 5.2 Communication

Our main form of communication is through email. Each team member is required to check their email regularly. We also have a group Telegram that is used quite a bit during build and competition season. It is highly encouraged that you ask to get added to the main chat for our team.

## 5.3 Safety

The Hitchhikers take the safety of our students, mentors, families, and guests very seriously. To ensure that everyone has access to the proper personal protective equipment, we keep a box of safety glasses and gloves in our build space. We also keep a first aid kit available in the build room in case of an incident.

A messy workshop is unsafe to work in. It also makes it harder to find things quickly and easily. After each meeting, we require our students to clean up their work area and the machines used.

Each student is required to take an annual safety training, pass a safety quiz, and adhere to the safety rules. These rules can be seen posted in the build space. If someone gets hurt, they must notify the mentors and fill out an incident report.

Our Safety Captain ensures that all safety procedures are followed. Anyone who does not follow the safety rules will be given a verbal warning first. A second violation of the rules will result in the student being sent home.

Safety Rules (as seen posted in the build room):

1. Remember, Safety First! Emergency phone # 911!
2. Conduct:  
   a. No horseplay.  
   b. Music, talking, etc. should be kept to normal conversation levels.  
   c. First Time Right.  
   d. Know the proper procedure when accomplishing a task. If unsure, ask.  
   e. Do not operate any machinery while impaired, i.e. under medication, tired, distracted, (using phones, PDAs, iPods), etc.  
   f. All injuries must be reported and an incident report filed.
3. Gear (Personal Protective Equipment, PPE):  
   a. Safety glasses must be worn at all times.  
   b. No open-toed footwear allowed.  
   c. Secure loose clothing, hair, etc. prior to operating machinery.  
   d. Wear additional safety gear such as gloves, ear plugs as necessary
4. Tool Use:  
   a. Use the correct tool for the job.  
   b. Do not use a tool other than for its intended purpose and always with the proper safety guards, shields, etc. in place for that tool.  
   c. Do not operate any equipment unless you are authorized to use it.  
   d. Observe “two man rule” when using power equipment.  
   e. Do not use a tool with a worn or damaged power cord.  
   f. Always check for correct setup of a tool prior to operation.  
   g. Do not touch moving tool parts.  
   h. Servicing of equipment shall be done in accordance with safety manual procedures.
5. Housekeeping:  
   a. Tools should be properly stowed when finished with them.  
   b. All work areas will be kept clean and neat.  
   c. Build room must be presentable to sponsors at all times.  
   d. Food allowed in designated areas only; all refuse to be removed daily.

## 5.4 Teamwork

We are a team, and we expect our students to work as a team. A good team

does not point the blame at each other and make excuses for their mistakes and failures. A good team recognizes that they win and lose together. They do not hide their errors, but admit and learn from them. They encourage and help each other out. We expect all of our students to be a good teammate and to work with integrity.

## 5.5 Meetings

Our meeting schedule varies depending on the time of year. During the build and competition season (Jan-April), the team will meet on most days. Meetings in the spring and summer will be determined by need, and weekly meetings will start in the fall for training and to get ready for off-season competitions. Our meeting schedule will be sent out by the Co-captains.

The first 5 minutes of each meeting will be a “stand-up meeting” run by the Co-captains. This part of the meeting will be where each Sub-Team lead gives a short description on what they did the previous day, what they plan to do that day, what roadblocks stand in their way, and safety precautions to consider.

## 5.6 Outreach

One of the most important things we do as a team is community outreach. It

is a way to promote our team, spread the message of *FIRST*, and build connections with our community. All team members are required to participate in our various outreach events. This includes robot demonstrations, robotics camps, community service, fundraisers, and FLL (*FIRST* Lego League) competitions. Students must sign up on the Hitchhiker Schedule in advance if they plan to help out with an event.

## 5.7 Competition

Since *FIRST* North Carolina moved to a district model, the majority of our

competitions are a 2-4 hour drive away. Our team usually attends 2-3 district events. If we qualify, we may also attend the NC State Championship and World Championships. Competitions are fun, but they require a lot of time, energy, and work. Below are some general rules and requirements for our team members at competitions:

* ***Scouting*** -- If you are not on the Pit Crew or Drive Team, you are required to do at least one shift of Scouting. It may not seem as exciting as driving the robot, but it is equally as important.
* ***Cheering*** --Each member is required to cheer on our team and our alliance at competitions. We do not expect you to be jumping up and down, yelling at the top of your lungs, but we do expect you to pay attention and cheer to the best of your ability during our matches.
* ***Pit*** --If you are not needed in the pit (i.e. if you are not pit crew or drive team), do not be in the pit! There is limited space in the pits, and this will prevent unnecessary crowding.
* ***Conduct*** --A team member’s conduct reflects on our team, our sponsors, and Athens Drive High School. Team members are required to be on their best behavior during competitions. We expect each member to practice good safety, Gracious ProfessionalismⓇ, and help out where needed on our team and with other teams. Unkind talk about fellow teammates or other teams will not be tolerated.

## 5.8 Student/Parent Participation

FRC is an extracurricular activity that requires a significant time

commitment. All team members are required to participate in meetings, outreach events, training sessions, and competitions. This is a year round commitment.

Student Involvement:

Students are required to participate and contribute to the team during the off-season and during the build and competition season. We also expect and require each student to help with a minimum of 4 outreach events and attend at least 1 competition per season. We expect our students to help out with any fundraising for our team and any writing for the Chairman’s submission if asked. Though it is mainly the responsibility of the Fundraising/Entrepreneurship Team to write Chairman’s up, it is also a team responsibility to help out.

Parent Involvement:

Our students’ parents play a significant role on our team. Without their support, The Hitchhikers could not exist. There are a few expectations of our parents:

* Complete and submit the necessary forms and dues on time
* Attend parent meetings
* If their student’s behavior violates our Code of Conduct, parents may be called to pick their student up
* Parents are required to help out with the various aspects of the team: mentoring, arranging travel, building field elements, transporting robots and materials for demos etc.

## 5.9 Dress Code

Outreach:

During all outreach events, team members must wear an orange Hitchhiker

shirt, preferably the most recent year’s design with pants. Community service is the only exception where team members may opt to wear something else to avoid ruining their team shirt.

Competitions:

During all competitions, team members and mentors must wear the current year’s orange Hitchhikers shirt preferably with blue jeans. The Hitchhikers hoodie is also strongly encouraged to replace any personal jackets.

## 5.10 Code of Conduct

1. Understand and follow the Handbook and safety rules.
2. No excessive swearing.
3. Show good sportsmanship.
4. Have respect for the team, its members, leaders, and mentors.
5. Encourage and support teammates at all times. Members should never criticize a teammate nor blame someone for a bad play or a loss. A successful team works together, and wins and loses together.
6. No PDA.
7. Every student should wear: clothing free from language or graphics that are discriminatory, profane, or political in nature; depict violence, illegal substances, or alcohol. Appropriate closed toe footwear to robot activities and in working environment.

# Section 6: Contracts

Below is a list and short description of our team contracts:

* **Student Contract** -- This contract outlines the expectations of the students on our team.
* **Student Consent and Release Form** -- This contract outlines the risks that come from being on our team, asks for various permissions, and includes the medical form.
* **Optimist Club of Raleigh Facility Waiver** -- The Optimist Club of Raleigh have graciously given us our current build space. This contract is a release of The Optimist Club of Raleigh’s liability for any property loss, damage, or bodily harm that occurs on their property.
* **Mentor Contract** -- This contract outlines the expectations of the mentors on our team.
* **Coach Contract** -- This contract outlines the expectations of the coaches on our team.
* **Drive Team Contract** -- This contract expands on the Drive Team’s responsibilities.

## 6.1 General Contracts

All students, whether new or veteran, must complete and turn in the Student Contract, the Student Consent and Release Form, and the Optimist Club of Raleigh Facility Waiver.

Anyone who plans to mentor our team must complete and turn in the Mentor Contract and the Optimist Club of Raleigh Facility Waiver. Coaches must fill out the Coach Contract and the Optimist Club of Raleigh Facility Waiver.

## 6.2 Unique Contracts

The Drive Team Contract is for the students who join the Drive Team. It includes a few more guidelines for this sub-team that we expect to be followed. *FIRST* also has a few unique contracts that we may ask students to fill out when necessary.