

***FIRST* Robotics Competition  
Team 3357**

# **Comets**

**Creation Outstanding Minds Embracing Technology & Science**

## **Team Handbook**

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## **What is *FIRST*?**

*FIRST* is an acronym – For Inspiration & Recognition of Science & Technology. *FIRST* was founded by inventor Dean Kamen as a way to inspire students in areas of science and technology. The approach is to create a type of sporting event that requires use of the students minds to solve problems using science and technology.

*FIRST* is different from other science related competitions. *FIRST* requires students to team up with mentors, typically professionals in engineering, technology and other technical areas. Together, students and mentors work together to solve problems in real-world circumstances. The problems are difficult, there is never enough time or money to do it properly. Deadlines are strictly enforced as are design rules (size, weight, etc.).

## **Team Mission / Vision**

The mission of FRC Team #3357 is to ensure that all students participating have an opportunity to learn from professionals, solve difficult problems and have ownership of something tangible in a safe and supervised environment.

Students will be encouraged to do outstanding work, work that they will be proud of, and the mentors will also take pride in the work of the students.

Team 3357 will also be responsible for promoting *FIRST* by starting new *FIRST* teams, making off-season public appearances and promoting *FIRST* on the Internet.

## **Team History**

Prior to 2007, Forest Hills Public Schools partnered with Northview High School to assemble Team 1227, The Techno-Gremlins. In 2007 sponsorship for Team 1227 dried up and Forest Hills students began working with the team from Creston High School, Team 904. For three years, students from Forest Hills became an integral part of Team 904, providing much talent and helping Team 904 become finalists at the State of Michigan Championship in 2009. This also earned 904 the right travel to Atlanta and compete in the World Championships.

In the fall of 2009 there seemed to be enough interest in Forest Hills to attempt to try again for a Forest Hills team. With help from Team 2771, Code Red, Forest Hills was able to gain consent from Forest Hills to start a new team and on Friday November 13, 2009 the application was submitted and Team 3357 was created.

## **Overall Team Structure**

### Robotics Boosters

As a non-profit entity, Team 3357's Robotics Boosters elects a board of directors yearly. This board of directors will be in charge of decisions regarding the purchase of any items for the team or team travel.

### Professional Mentors

These adults are professionals with experience in a related field that is pertinent to the success of the team. Professional mentors work closely with the students to help them solve the problems they are working on.

### Non-Engineering Mentors

Primarily adults or parents wanting to help the team in a non-engineering capacity. Non-engineering mentors can help with arrangements of food and other logistics that are important for the success of the team.

### Student Mentors

Typically a college student with prior experience on a *FIRST* team. Student mentors will assist the team in areas where they have experience. This may be from the participation on a prior team or college. As students graduate from high-school and begin college, if possible, they will be encouraged to become student mentors, while maintaining a mature, team-oriented focus.

### Student Leadership

Prior to the start of each season, student leadership will be established. The student leaders will be determined by the team and will consist of experienced team members. The team leaders will work with the group leaders to report team progress at specified team meetings.

### Students

High-school students looking for a highly-challenging, yet extremely rewarding experience. Students will be expected to maintain a suitable GPA. Students will also be expected to attend regular team meetings and provide efforts to make the team successful. If a student needs to miss a meeting, it will be expected that the student notify a professional mentor on the team.

## **The Four Seasons**

### Build Season

The build season starts at "Kick Off" when the game is unveiled and the kit of parts is issued. The build season ends approximately 6 weeks later when the robot is "bagged". During build season expect to meet every evening on Monday through Friday and then a full day on Saturday. This schedule may change depending on the team's progress.

### Competition Season

Competition season starts immediately after the robot is bagged and the team begins to compete. Students will need to switch to competition season sub-teams as now the team requirements have changed. Students may be required to provide support if repairs to the robot are required during competition.

### Off-Season

Students will continue to meet occasionally, work on recruiting new sponsors, and compete in off-season events. Students may be asked to volunteer at events, attend public displays of the team.

### Pre-Build Season

Students will meet regularly and begin to hone their skills in their preferred areas, in preparation for the start of the new Build Season.

### **Build Season Student Sub-Teams (critical)**

Students will be separated into smaller knowledge areas or interest groups. In order to have a competitive and successful team, the following sub-teams will be required.

#### Design / Engineering Team

It is the intent of the team to have all students participate in small groups on robot design. Every student's input is valuable and every suggestion will be treated with respect. In situations where problem solving becomes challenging, mentors will assist students to mutually solve the design problem.

#### Build Team

The build team will fabricate all parts that are required to build the robot and its driver's station. Under the close supervision of professionals, students will fabricate and assemble stock parts, motors, and a variety of sensors as described by the design team. This team will also be responsible for post-match inspection of all mechanical components.

#### Electrical / Wiring Team

This team will be responsible for layout and design of the wiring on both the robot and driver's station, and wiring all components together in a neat fashion. Students may learn skills including using a digital mult-meter and soldering. All activities will be supervised by a professional mentor. This team will be responsible for post-match inspection of all electrical components.

#### Programming Team

Programming team will work closely with the build and electrical teams to configure sensors as required by the design. The programming team will design and develop the software that runs on the robot's on-board computer. The software will guide the robot autonomously (if needed) as well as allow the drive team to communicate with the robot during the match. It will be the programmers' responsibility to maintain versioning of the software and to ensure that the proper software is loaded prior to every match.

#### Marketing

The marketing team will be responsible for ensuring the team's future by recruiting sponsors and providing a public face that represents the team. The marketing team will meet with school officials to maintain their continued support. The marketing team will work closely with support groups responsible for still photography, video and website development. The marketing team will also prepare the Chairman's Award presentation / video (if required).

## **Build Season Student Sub-Teams (not critical)**

### Animation

The animation team is responsible for creating 3D animations for the team. Typically teams have the opportunity to create a safety animation in the fall to show how they work safely. During the competition season *FIRST* has an animation contest where students are encouraged to create a 30 second 3D animation on a given topic. Students will use 3D Studio Max (3DS Max), a very powerful animation software package provided to each team.

### CAD

Students interested in learning CAD (Computer Aided Design) will use Pro/ENGINEER (Pro/E) to electronically design parts and assemblies that comprise the robot. These files will also help manufacture special or custom parts. This sub-team may become critical if the design and production of custom parts is desired.

### Web Site Development

An online presence is always a good thing for any team, especially when trying to show a potential sponsor what the team does. Students interested in website development can work with the various other sub-teams to create a clean website that is easy to navigate.

## **Student Support Roles**

### Photographer / Videographer

It is necessary to have good images and videos for the marketing team to use. Students interested in these areas will have ample opportunities to document the team's progress.

### Membership Maintenance

A couple of students should share the responsibility of keeping the team's membership database up to date. As the team evolves the methods may change.

### Writers / Bloggers

Students that like to write and have a flair with words will have the opportunity to update the team's progress on either the team's website, blog or both. Facebook and other social networking services may also be targeted.

### Online Public Relations

All students should monitor the *FIRST* community known as Chief Delphi. Chief Delphi is a website created by the team of the same name. It was created by the team from Pontiac (the Chiefs) and their sponsor, Delphi, hence Chief Delphi - Team 47. The website <http://www.chiefdelphi.com> is an online community for all *FIRST* teams. It is a place to ask questions and also answer questions at the same time building a positive reputation for our team. All students should be encouraged to be a part of this community.

## **Competition Season Student Sub-Teams**

### Drive Team

Typically 3 students and one mentor make up the drive team. This is the team that is on the field during every match, controlling the robot and working with the other alliance partners to win. Drivers will need excellent communication skills along with extraordinary hand-eye coordination, quick reflexes and the ability to think quick. This team will be established mid-way through the build season. This team can be comprised of students from any build season team.

### Safety Captain

It is the responsibility of all team members, adults and students, to take safety seriously. There will be one student on the team that will be the Safety Captain and this student will be in charge of team safety as well as determining which other teams to award our safety tokens. It will be expected that the Safety Captain has a thorough understanding of the FRC Safety Manual.

### Scouting Team

The more students on this team the better. Scouts will be watching the competition, identifying teams that we would choose as partners in the elimination rounds. This group of students will also visit the pit area of all teams in the competition to both discover potential partners, as well as provide information about 3357 to other teams. Scouting will need to be a continuous process and Scouts will work in shifts.

### Pit Team

Like scouting, someone needs to be in the pits at all times. Judges will be visiting teams and talking with students in the pits. Teams are judged on the pit representatives knowledge of their machine, safety and the meaning of *FIRST*. The Safety Captain will also be a part of the Pit Team.

### Team Spirit

All students will be required to show extreme enthusiasm during competitions. Typically, when cheering during a match, cheering is done for the entire alliance. Alliances are either the red alliance or blue alliance, and it is more acceptable to cheer for either red or blue. This is not a strict rule, and there will be plenty of opportunities to cheer for 3357. It will also be considered good Gracious Professionalism to cheer for teams 2771 and 904.

### Chairman's Award Presenters

If a Chairman's Award presentation is submitted, a group of 3 students will be interviewed at the competition where the presentation was submitted. These students will be allowed to give a presentation of how their team represents *FIRST* and what they do to grow the *FIRST* community. They will also be asked questions from a panel of judges. The Chairman's Award is the highest and most sought after award given by *FIRST*.

## **Behaviour at Competitions**

At all competitions students will be expected to be on their best behaviour. Students are representing the team and will be expected to act in a professional manner.

## Awards

- Chairman's Award
- Champion
- Championship Finalist
- Coopertition Award
- Creativity Award
- Division Champion
- Division Finalist
- Engineering Inspiration Award
- Entrepreneurship Award
- Excellence in Design Award
- Gracious Professionalism Award
- Highest Rookie Seed
- Imagery Award
- Industrial Design Award
- Industrial Safety Award
- Innovation in Control Award
- Judges Award
- Quality Award
- District Winner
- District Finalist
- Rookie All Star
- Rookie Inspiration
- Team Spirit Award
- Website

Students should be knowledgeable of these awards and what is expected of the team to win them. To learn more about these awards, visit the official *FIRST* website at: <http://usfirst.org>

The official forums for *FIRST* can be accessed here: <http://forums.usfirst.org/> Use this site for official Q & A from *FIRST* directly.

All students and adults associated with *FIRST* through this team should register with *FIRST* at: <http://firstcommunity.usfirst.org/>