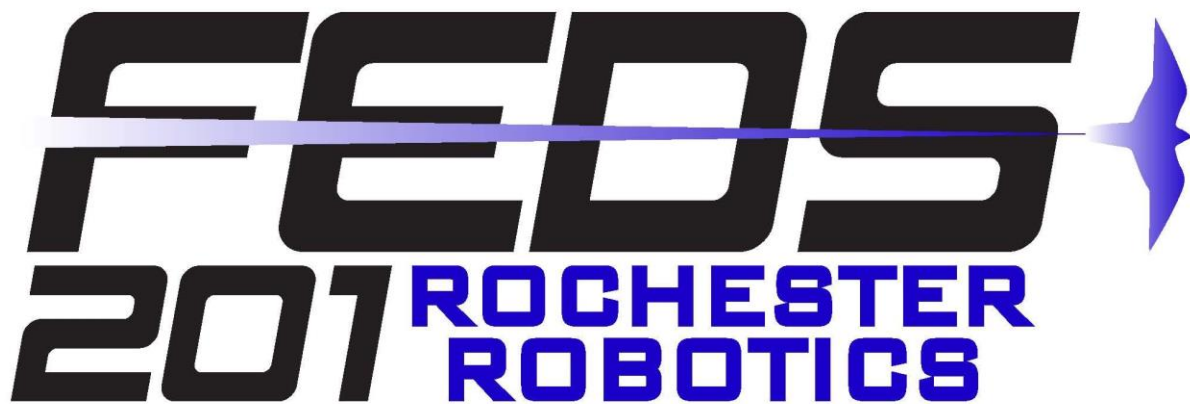


# **Rochester High School Robotics (FRC 201) Team Handbook**



## **Introduction**

Welcome to Team 201: The FEDS! We hope you will find your experience very rewarding and enjoyable. This guide is intended to give you and your parent/guardian an understanding of the program and the required responsibilities. In the following pages you will find information relating to team rules, expectations, and many other aspects of our team and FIRST.

As a FIRST Robotics member, you have an incredible opportunity to gain knowledge and share your enthusiasm while growing into future Business, Technology, and Engineering Leaders. You will participate in a life changing experience, and have the opportunity to learn many skills that will help you in your future, from networking with other teams and gaining sponsorships to designing and building a robot to our own specifications to working as a fully functional team with a varied group of people.

The success of Team 201 in robotics and its numerous other activities is due to the dedication of our members (this includes our Students, Mentors, and Parents) acting as a TEAM. Your participation is essential to fulfilling our program's goals. Every member's commitment and responsibility keeps our team running smoothly. The possibilities are only limited by your engagement and enthusiasm. We encourage you to have an abundance of both!

## **Purpose Statement**

Provide hands on Science, Technology, Engineering, and Mathematics (STEM) experience for our students centered on the FIRST Robotics Competition. The team will use this experience to provide students practical, technical, business and community relations experiences and to promote STEM within the school district as well as the community of Rochester/Rochester Hills.

For additional information please refer to the following websites:

[www.feds201.com](http://www.feds201.com) – Team 201 website

[www.firstinspires.org](http://www.firstinspires.org) – FIRST Robotics website

[www.firstinmichigan.org](http://www.firstinmichigan.org) – FIRST Michigan district information

[www.chiefdelphi.com/forums](http://www.chiefdelphi.com/forums) - FIRST teams' discussion forums

## **Joining the Team**

All Rochester High School students are eligible to apply to Team 201. Members must submit an application and participate in an interview with a Team Mentor. New students will participate in an interview in the Fall. Returning students will be interviewed at the end of the prior season in the Spring. Decisions about student groups/roles will be based on the prior year's level of commitment, including project hours, event attendance and dedication to the team. The new members will also need to submit an application and participation in an interview.

Due to the high costs of materials, registration, and other fees associated with robotics, each team member will contribute a participation fee of \$201 to be paid by day of Parent/Student Orientation. The fee is payable by either cash or check made to Rochester Community Schools.

There is an additional club fee of \$30, that should be paid directly to the school at the [RCS website](#). Students with financial hardship will not be prevented from participating and should contact Team 201's teacher sponsor to express any concerns.

## **FIRST Consent and Release forms**

FIRST requires all youth team members to register as a member of a specific FIRST team via [www.firstinspires.org](http://www.firstinspires.org). The student will create a user account and provide the parent/guardian email address. Our team number is 201 and the program is FRC. The parent should receive an email to complete the registration and electronically sign the FIRST Consent and Release Form. Additional Team 201 forms can be found on our [website](#).

## **What is FIRST?**

FIRST (For Inspiration and Recognition of Science and Technology) was founded by inventor Dean Kamen to inspire young people's interest and participation in science and technology. FIRST is volunteer-driven and built on partnerships with individuals, businesses, educational institutions, and government. Some of the world's most respected companies provide funding, mentorship time, talent, and equipment to make FIRST's mission a reality. Visit the website at [www.firstinspires.org](http://www.firstinspires.org). There are various levels within FIRST including Junior FIRST Lego League (6-9 year olds), FIRST Lego League (grades 4-8), FIRST Tech Challenge and FIRST Robotics Challenge. These programs are high-tech spectator sports.

## **FRC (FIRST Robotics Competition)**

The competition season typically starts at the end of February and lasts for six weeks. Team 201 will participate in a minimum of two Michigan District competitions during the regular season, those competitions occur from Thursday evening through Saturday evening. Each year FRC unveils a new challenge at kickoff in January. High school students work with professional mentors to solve the engineering design problem in just six weeks, and then join other teams in alliances to play the game at competition events where they are judged on design, innovation, and performance. Students learn teamwork, acquire technical skills, develop business acumen, and discover strengths they never knew they had. The program is a life-changing, career-molding experience and it's a lot of fun. Be competitive and play hard on the field, but it is much, much more than a game.

## **Gracious Professionalism (GP)**

The FIRST organization is based on the principles of teamwork and the concept of gracious professionalism, which 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. With GP, fierce competition and mutual gain are not separate notions. Gracious professionals learn and compete like crazy, but treat one another with respect and kindness in the process. GP does not demand that our kindness be returned before we decide to give ours. The importance of GP is to better ourselves, rather than others, becoming responsible citizens and improving our

society by example. Years from now our team alumni will remember a great play, some adversities overcome, helping out another team in need, but not so much the plastic trophies collecting dust.

## **What We Do**

Team 201 members participate in a number of technical and non-technical programs, as described below.

### **The FIRST Robotics Competition (FRC) and Build**

#### **Build**

Season kickoff is in January on the first Saturday after New Year's. This is when the new game for the season is revealed worldwide. Robot build season runs from January to mid-February. The team will meet 6 days a week, this includes: M-Fri from 6:00 to 9:00pm (or later) and Saturday from 9:00am to 5:00 pm (or later). Lunch will be provided during Saturday meetings by the team.

#### **Competition**

Team 201 will participate in a minimum of two Michigan District competitions held from Thursday evening through Saturday evening, typically starting in March and running for six weeks. Students will miss 1 day of school (for each event) if they attend a district competition (school related excused absence). These typically are not overnight trips and parent volunteers are required to provide transportation. Additional cash will be required for lunch during these competitions.

The top 160 teams that qualify, after District competitions, go to the Michigan State Championship (Saginaw, MI), typically the second week of April (which may coincide with Spring Break week). Students normally miss 2 days of school (school-related excused absence) if they attend the Michigan State Championships if it is not held during Spring Break week. Team members will be required to pay additional fees to cover lodging, travel, and meal expenses. The top 80 teams from the state, based on ranking points from the competition season, qualify for the FRC World Championship held in Detroit, MI in late April. Students will miss 3 days of school if they attend the World Championships (school-related excused absence).

### **General Schedule Overview**

#### **Fall – moderate schedule**

- Recruit new members
- Team meeting one evening a week for training and projects
- Outreach events
- Off-season competitions
- Fundraising / Sponsorship kickoff
- Training

- Preparation for Chairman's Award

**Winter – busiest time for us**

- January kickoff and six intense weeks of robot design and construction
- Brainstorm game play, strategies, robot designs
- Construction of practice field
- Design/build/integrate sub-systems
- Test and redesign/rebuild as necessary
- Final programming integration
- Driver testing/practice
- Preparation for award submissions

**Spring – heavy involvement primarily during events**

- Robot out of bag fix-it windows to repair/upgrade robot
- Two three-day district events
- Michigan State Championship, if qualify
- World Championship, if qualify and have funds available
- Outreach activities
- Season assessment
- End of Season celebration/Sponsor Night and awards

**Summer – light effort**

- Outreach events
- Off season competition events
- Training – optional, as needed
- Fall preparations

**Sub-teams**

All work on team projects is divided into different categories and assigned to the corresponding group. Each sub-team is led by a student leader(s) and mentor who delegate work to its members. Students may participate in multiple sub-teams, as time and interest allows, but will often be designated as having primary and secondary obligations to specified teams.

**The functions of the various sub-teams are listed below:**

**1. Mechanical Group**

Responsible for prototyping, assembly, testing, and repair of the robot

**2. Design Group**

Responsible for designing the robot on the computer. Using the prototypes, they generate CAD (Computer-Aided Design) drawings for the fabrication group to manufacture parts which the mechanical team will use for the completed robot.

**3. Machining Group**

Responsible for manufacturing customized parts for the robot using the machine shop and its equipment.

#### **4. Electrical Group**

Responsible for wiring all motors, compressors, talons, solenoids, etc. The wires shall be labeled and neatly arranged for ease of maintenance. Board layout and packaging must be worked out with the Mechanical group.

#### **5. Programming Group**

Uses software provided by FIRST to create a program that allows the robot to perform various tasks and functions – both autonomously and by human control. Also builds the interface between the controls and the robot, with input and agreement between the users who will be interacting with the controls, and the mentors.

#### **6. Scouting Group**

Comprised of pit scouts and game scouts. Students in this group will develop materials and methods to assess the competition, giving our team as much advantage as possible. The collection of data and analysis of the information will assist our team in all phases of the competition. Additional students will be assigned scouting duties during competitions.

#### **7. Safety Group**

Responsible for reading and ensuring all safety rules are being followed at our build site and at competitions.

#### **8. Field Group**

Design and build practice field using FIRST specifications for the current year's game.

#### **9. Fundraising Group**

Organize and develop a campaign to raise the necessary funds for the team. This includes creating the materials to reach out to potential sponsors, managing the process of contacting and maintaining corporate sponsors, and organizing events to contribute to this effort.

#### **10. Communications Group**

Responsible for all within team communications; manages team roster and calendar, coordinates work with other groups; manages team email distribution lists and sends out timely reminders via Remind, Discord and email.

#### **11. Business Planning Group**

Responsible for developing business plan, monitoring team funds, and coordinating financial activities with our High School business contacts.

#### **12. FIRST/STEM Outreach Group**

Responsible for coordinating the team's efforts to start more FIRST teams and participate in STEM-related outreach events.

#### **13. Marketing/STEM Advocacy Group**

Responsible for design and production of team newsletters, sponsor updates, brochures, banners, and other materials in order to present a cohesive team brand. Responsible for keeping a record of team activities through reporting and photography. Responsible for advocacy with stakeholders to support STEM education and FIRST robotics.

#### **14. Spirit Group**

Responsible for creation of items to identify and promote the team, such as chants, dances, t-shirts and buttons.

#### **15. Social Media / Website Group**

Responsible for creation/maintenance of content presented through the team website and various social media platforms to develop community awareness of FIRST and Team 201.

#### **16. Chairman's/Awards Group**

Determine which awards the team is working towards, communicate requirements to the team, and develop the award presentations.

#### **17. Event Logistics Group**

Responsible for making travel and meal arrangements during competition season and events. Develop and communicate itinerary, collect paperwork for attendees, and communicate with school.

#### **18. Drive Team**

Consists of a field coach, a controls operator, a robot driver, and a human player. A competitive selection process will be used to identify both a main team and a back-up team.

#### **19. Pit Crew**

During competitions, make sure that pit is setup, ensure all tools and materials needed for robot maintenance are available, make certain that batteries are charged and ready to go. These students should have detailed knowledge of the robot subsystems in order to keep our robot in working condition and to assist other teams as needed.

### **Member Expectations**

- Members must maintain academic eligibility as per school policy.
- Members must wear their team approved apparel at events.
- Members are expected to participate in a minimum of half of all outreach events sponsored by the team. These vary by season but may include community service activities, STEM outreach and FIRST events.
- Members will abide by the [RCS Code of Conduct](#) and the [Acceptable Use for Technology Agreement](#) at all times.
- Members will communicate their transportation needs in a timely manner, since transportation is provided by mentors and parents. Failure to respond may require the student to make their own travel arrangements.
- Members will notify team leadership when they will be absent from required activities via [feds201attendance@gmail.com](mailto:feds201attendance@gmail.com).
- Members must sign up for the team Remind 101 by texting @feds201 to 81010.

- Members must maintain and monitor an active student/parent email account.
- Members must sign up for the Discord app, FEDS 201 group.
- Social media accounts using the FEDS 201 name, or referring to the FEDS 201 team, must be overseen by the Operations Committee of the team.

**Members will demonstrate appropriate behavior at all times in school and at FIRST events, including:**

- Operating in accordance to [Gracious Professionalism](#)
- Demonstrate good judgment
- Respectful behavior to team colleagues, other teams and officials, using positive behavior and language, including social media
- Ability to commit to and follow through on a project
- Ability to work independently and as a team member
- Honesty and integrity
- Teamwork, cooperation, and mutual respect will take priority during meetings and competition. Personal relationships should not impact the success of our team.

**Mentors reserve the right to discipline a team member as necessary for the safety of the student and the overall good of the team. Any infractions that are considered serious will be forwarded to the teacher sponsor and high school administration for discipline.**

**Team Member in Good Standing**

- All team members are expected to remain in ‘Good Standing’ on the team by adhering to the policies and guidelines outlined in this handbook and in the [RCS Code of Conduct](#) and the [Acceptable Use for Technology Agreement](#) at all times.

**Team Member in Good Standing privileges:**

Student is eligible for lead roles (if selected)

Student is eligible for participation on drive team or pit crew (if selected).

Student is eligible to miss school for competitions

Earn recognition items such as a varsity letter at year end (note: 2 years of good standing required for varsity letter)

**Team 201 will utilize a 3-strike policy as follows:**

**Strikes are defined as:**

- Failure to meet monthly attendance expectations (>50% October – December; >75% January – April)
- Failure to pay team fee (each month past due date is considered a strike)
- Failure to act safely (consistent negligence or single major offense)
- Behavior or engagement inconsistent with the [RCS Code of Conduct](#) and the [Acceptable Use for Technology Agreement](#).

**Strike One:** A written notice of warning will be issued to the student member and parents. The student will remain in good standing with the team.



**Strike Two:** The student will not be in ‘Good Standing’ with the team, and will lose associated privileges. (A written notice will be sent to both student and parents.)

**Strike Three:** The student shall be removed from the team. (A written notice will be sent to both student and parents.)

### **Return to good standing:**

The first strike can be eliminated by 2 consecutive months of ‘Good Standing Performance’ following strike one. (Full payment of team fee will immediately remove a ‘failure to pay’ strike).

A **student with two strikes** will need to submit an essay to the Coach/Teacher Sponsor. The essay shall be an explanation of why the student should be returned to good standing status. If the Coach/Teacher Sponsor accepts the explanation, the student will be returned to good standing, but still has one strike.

A student that has **received a 3<sup>rd</sup> strike** will be removed from the team. The student may reapply to join the team the following year, but there is no guarantee that membership will be granted. There will be no refund of team fees already paid.

Note: Strikes will be tracked by the School Teacher Sponsor.

### **Safety**

In order to run any successful business or team, a high level of safety must be observed, practiced, and maintained. The following rules are designed to ensure the safety of students, mentors, and any visitors to the Rochester High School Shop Area where Team 201 is based.

- Safety glasses must be worn at all times in the shop and while working on the robot and its components, and in the pits at competition.
- Horseplay will not be allowed at any time.
- Members will be trained and certified by a mentor before using machinery independently.
- All equipment will be handled with extreme care and caution.
- Work areas will be kept neat and orderly.
- Appropriate footwear with fully enclosed shoes (no sandals or flip flops) must be worn in the shop and at competition.
- Hair will be tied back while operating any equipment or standing near equipment that is in operation.
- No loose clothing is to be worn while operating equipment or standing near equipment that is in operation.
- No food or drink near any equipment.
- Equipment, tools, and supplies must be put away every night and work areas must be left clean.

### **Parent/Guardian Responsibilities**

Parents/guardians are encouraged to become team mentors (technical or non-technical). The effort is more than rewarded with the experience of helping young minds grow, and the program runs entirely with volunteer mentors. No mentors = no robotics team. The parents/guardians of the students are an important part of the success of the team.

**Our team needs actively engaged mentors in the following areas:**

- Programming
- Electrical
- Mechanical
- Machining
- CAD Design
- Videography/Editing
- Photography
- Business Planning
- Branding/Marketing
- Website Design
- Social Media
- Safety

Whether you engage as a mentor or a volunteer, you fill a vital role to make this team possible.

**Generally, each student's parent/guardian is expected to sign up for a minimum of 4 volunteer slots throughout a season.**

**Additional parent responsibilities include:**

- Attend parent meetings
- Make sure students are on time for meetings, build times, and events. Timely transportation must also be provided home afterwards.
- Sign and return permission slips, waiver forms and other required documents by designated due date.
- Provide telephone numbers where they can be reached in an emergency.
- Provide and monitor a dependable email address to receive team correspondence.
- Parents/guardians are responsible for the conduct of their child.
- Parents/guardians are encouraged to attend all events and provide support for the team.
- Parents/guardians are encouraged to keep up-to-date with what their child is working on with the team and the progress that the team has made.
- Parents/guardians are encouraged to become team mentors (technical or non-technical), which adds additional responsibilities but is a very rewarding experience.
- Notify the team when student will be absent from a team event where they are expected.

## **Competition Protocol**

### **Participation**

It is expected that you fulfill your duties as a team member in the role you have agreed to and in any supporting role you can to assist the current needs of the team. Attending competition is a

privilege, not a right. Since these events cause students to miss class time, students are expected to remain involved at competition in team related activities (competition, video, photography, pits, scouting, cheering, presentations, etc.). Students not involved in the pits, field activities, or presentations should remain in the stands with the team.

- **Participation in competitions is a lot of fun and encouraged.** If you will not be participating in a competition, please let the lead mentor know as soon as possible so that the team can allocate competition duties efficiently and effectively.
- Team members attending the competitions are required to attend the whole competition. While at competitions, students are expected to perform their assigned duties. Team members are required to remain with the team throughout the entire competition. Failure to do so will result in ineligibility to attend future competitions.
- Students shall keep their adult mentors informed of their specific activities and whereabouts at all times. Students may not use their own cars or ride in cars belonging to other students during the competition. The buddy system will be strictly enforced. Students must always be with their partner. Students must not be alone at any time.
- Uniforms are to be worn at all times during competition and not be covered by other non team apparel.
- Approved eye protection must be worn at all times by all team members and their guests while in the pit areas.
- Card playing, electronic games, CD players, MP3, Cell Phones (except phone calls) and other such activities are not allowed during the competition, but are allowed while traveling and at hotels.
- Students may be responsible for their meals at competitions.
- Because travel is required to and from competitions, students not on the official roster for a competition must be accompanied by their parent if they wish to attend the event. Students not on the official roster must not interfere with or interrupt team activities. If they do so, they will be asked to leave and they will jeopardize their future team travel opportunities.

### **Room/Hotel Behavior**

- Attendants are guests using the facilities, special care should be taken to not deface or destroy any property. Individuals, who inflict damage to the hotel rooms or the building, will be held liable for any costs incurred for repair.
- Curfew regulations shall be interpreted to mean that each person shall be in his/her hotel room by the published curfew. No team activities will occur after curfew. Room checks will be made nightly by mentors. Once a room check is made, students may not leave their room. Each student shall remain in his/her room until a predetermined time the next morning. Each student will be given the room number and phone number of the mentor(s) to call in case a problem arises during the night.
- Students of the opposite gender are **NOT ALLOWED** to enter each other's room. When possible, we will have a designated room where students can socialize, play cards or watch movies together, while being supervised by a mentor or adult chaperone.

- Only people who are on the official team travel roster may be in a team hotel room. Students from other teams, friends or RCS students who are not on the travel roster may not be in the team rooms.
- Mentors are responsible for taking all reasonable precautions to ensure the safety of their students and must be readily available in case of an emergency.
- It is agreed that, upon violation of the [RCS Code of Conduct](#) and the [Acceptable Use for Technology Agreement](#), the violators' parents will be notified. And the violator will be sent home at their parents' expense. Students violating the Code of Conduct at FIRST competitions will be disqualified from competitive awards.
- Serious misconduct shall be reported to the mentor, teacher sponsor, principal, parents, and if necessary, the proper authorities. Any further disciplinary action will be determined by the school administration and may result in at least one calendar year of ineligibility.

## **Cheering**

Gracious professionalism comes into play strongly when we're in the stands rooting on our team as well as others. We want all the students on all the teams to do well, to feel good about themselves, and to be inspired by the competition. We are supportive and positive at all times under every adverse condition. Demonstrate by example what good sportsmanship is.

## **Awards**

We will stay until the end of the awards ceremonies. During the ceremony we will applaud the teams that are winning awards. When we applaud we will stand to show our respect for what they have accomplished.

## **Event Volunteers**

In addition to our team's volunteer needs, FIRST competition events are run solely by volunteers. Each FRC team is expected to provide a **minimum of two volunteers to each event** we participate in. These volunteer opportunities are facilitated through the FIRST in Michigan organization directly. The volunteer jobs do not require any prior knowledge of FIRST robotics. Please consider volunteering your time. In January of the current season, volunteer opportunities can be found at the following link:

<https://www.firstinmichigan.org/volunteer.php>

## **Safety at Competitions**

Safety should be practiced at all times. **Safety glasses must be worn in the pits by all members – students and adults.**

## **How Parents Participate**

### **General**

Recruit other parents, retirees, sponsor mentors, etc. Network through friends, family or co-workers.

Be an advocate for our team and FIRST with the school district and in our community.

Help your student attend team meetings by driving or arranging car pools.

### **Technical Mentor**

- General technical or engineering backgrounds, machinists, etc.
- Willingness to take a backseat and let students experiment, but to step-in when they need to learn something new.
- Mentoring needed for: structural, mechanical, electrical, pneumatic, control systems, CAD, computer animation, website, programming, safety

### **Non-Technical Mentor**

- Work with students in any of these areas:
- Organizational, management skills for running the team and coordinating meetings
- Writing essays and creating presentations for award submissions, college scholarship essays, promotional literature, competition judge presentation materials
- Art needed to decorate the Robotics room, our pit, shipping crate, website
- Crafts to develop spirit accessories and team awards given to other teams

### **Support Functions**

- Feeding the team during the build Jan/Feb season
- Solicit sponsors for cash donations, materials, engineering mentors, tools, machining, excess equipment, or material clearances
- Fundraising
- Can (deposits) drive fundraiser in the late fall; Barnes & Noble gift wrap in Nov-Dec
- Pays for FIRST and off-season competitions, transportation, travel food and offsets individual student expenses
- Travel/Events
- Coordinate permission slip creation with school sponsor
- Travel arrangements (bus, hotel, restaurant)
- Arrange to feed the team during competitions
- Recruit and schedule trip drivers and chaperones
- Spirit preparation
- Collect/manage fees for travel
- Team
- T-shirt orders
- Team handouts for competition
- Organize team building exercises
- Publicity and public relations
- Baking treats for competitions
- Promote team before the school board and administration
- Teacher/mentor/sponsor/senior awards and thank you's
- Videotaping/photography for meetings, mentoring, outreach
- End of season pot-luck party

- Coaching Business/Marketing team on business plan writing, branding plans, website development and social media presence
- Plan off-season events (Robo-Con, Maker's Fair, Kettering Kick-off event, Alpena)
- Connect our team to other schools' robotics and/or STEM programs
- Sew bumpers for our robot to sport at competition
- Chaperone students at the Fall Club Door Decorating event hosted by Student Council
- Chaperone students in creating robot décor for the Rochester Christmas parade
- Provide students a specialized training in your area of expertise, tying it to robotics
- Help Marketing group design newsletter layouts/provide editorial consultation
- Write press releases and distribute about our team's activities
- Parents of returning students: help us at the new parent/student orientation
- Make name tags for all students/mentors/parent volunteers by end of September
- Chaperone students to elementary and middle schools where they mentor younger robotics' teams
- Oversee videography efforts of the Chairman's group
- Write PTSA and/or RCS Foundation grant applications for the team
- Chaperone Barnes and Noble gift wrap session
- Chaperone students at the 8<sup>th</sup> Grade Parent Night (promote robotics)
- Returning parents: assist mentors at mandatory parent meetings prior to competitions to collect documents, make copies and plan travel
- Chaperone students at the PTSA STEAM fair and other STEM events in the community
- Plan team building activities after the end of the season
- Help the team host an elementary level STEM event

## **Additional Reasons to Become Involved in the Robotics Program:**

### **College & Career Opportunities**

The FEDS FIRST program is an excellent way to explore careers of engineering, communication, creative design, marketing and many other technical areas. During this program, students will be exposed to many principles of engineering, marketing, and various mentoring skills of professionals. We recognize the possibility that not all students will go on to careers in engineering. It is our goal, however, to expose all the students to technological careers including but not limited to engineering.

### **Scholarship Opportunities**

FIRST offers over \$20 million in scholarship opportunities to team members annually. While many of the scholarships are designed for those seeking degrees in engineering, math, and science, there are many that are available for any area of study. The FIRST web site ([www.firstinspires.org](http://www.firstinspires.org)) has a complete listing and additional information.