



Edina Robotics ***FIRST* Team 1816 -** **The Green Machine**

Team Handbook

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TEAM OVERVIEW

Edina Robotics *FIRST* Team 1816 - *The Green Machine* - is a group of Edina High School students interested in math, science, engineering, programming, business and marketing. With the help of adult volunteers and mentors, the team builds a robot to compete in the *FIRST* Robotics Competition. Team 1816 also raises funds through corporate sponsorships.

FIRST stands for “*For Inspiration and Recognition of Science and Technology.*” The *FIRST* Robotics Competition is an international organization that brings together professionals and students to solve an engineering design problem in an intense and competitive way. In 2009, the competition reached more than 37,000 high school students participating in more than 1,500 teams throughout the world competing in 41 regional events and one Championship competition. The competitions are high-tech spectator sporting events, the result of brainstorming, teamwork, mentoring, and project deadlines. The *FIRST* mission is dedicated to changing the way high school students regard science and technology. *FIRST* inspires an appreciation for the real-life rewards and career opportunities in these fields.

The team begins in the summer by securing funds to pay for the costs of a robot starter kit, competition fees, robot parts, and possibly some travel expenses. They also familiarize themselves with *FIRST* and the tools and software they may be using. At a *FIRST* kick-off event in January, the team learns the competition game scenario and game rules when they pick up their robot kit.

The team has only 6 weeks to complete their robot before it is shipped to their first regional competition site. Using a *FIRST*-provided kit of parts including motors, sensors, cameras and electronics, the team builds a full-scale robot. The team designs, builds, and programs their robot for the competitive game play.

A typical regional competition brings together 30 - 60 high schools and their robots at a coliseum-type facility for three days. The facility holds spectators, an arena for the robot competition, and a “pit area.” The pit area provides each team with a 10’ x 10’ station to fine-tune their robot between events. Teams compete with and against each other using their robots to play the game.

The team completes their season in the spring with a follow-up to their corporate sponsors. Various activities and events are planned throughout the summer, including fundraising, in preparation for the next competition season.



Team Mission Statement

The foremost goal of the Edina Robotics *FIRST* Team 1816 – The Green Machine – is to offer students positions of leadership and responsibility, and to create an environment that encourages creative problem-solving while promoting this unique atmosphere to fledgling teams. The Team will also furnish opportunities for students to work and build relationships with adult mentors possessing professional expertise. Additionally, the Team will strive to develop and apply the students’ knowledge of science, math, and business; and to spur interest in technological fields and environmentally supportive measures for the future.

Team History

In 2005, Edina High School junior Chris Miller, with a nucleus of friends, formed a robotics team at the high school for the purpose of competing in *FIRST* Robotics competitions. Chris, who was team captain, applied for and received a \$6,000 seed grant from NASA. This allowed the team to attend the kickoff in Milwaukee, WI in January 2006 and to receive the kit of parts and instructions about the competition game “Aim High.” The Edina team was assigned the *FIRST* number 1816, and the team adopted the nickname “*The Green Machine*.”

During our 2006 rookie season, 16 Edina students collaborated to design, build, and field a 5-foot tall robot. The team built the robot in the newly remodeled kitchen in the home of Chris Miller’s father. Our major sponsors in 2006 were NASA, Medtronic, Inc., and Edina Education Fund. We had an outstanding season, emerging as the winner of the Wisconsin Regional Competition with alliance partners Team 111-Wildstang and Team 1625-Winovation. At the Championship competition in Atlanta, the team finished as the 6th seed out of 85 teams in Archimedes Division and earned the “Highest Rookie Seed Award.”

In 2007, the team more than doubled its size to 35 students. Using warehouse space donated by Honeywell Inc., the team built a robot to compete in the game “Rack ‘n Roll.” We recruited and mentored seven new Minnesota teams, and helped host the first-ever Minnesota Kickoff at the University of Minnesota. The team also participated in the first-ever Fuel Cell project, winning second-place for a game design using hydrogen fuel cell powered robots. This participation earned us a trip to the Championship, where our team’s alliance finished as Division Finalists in the Newton Division. Our team ended the season by moving into shared construction workshop space with the EHS Thespians in Edina High School, while our computers are housed in a nearby classroom.

In 2008, the team’s 30 members poured much of its energy into Outreach efforts, including development and presentation of Minnesota Splash, a first-ever pre-season event focused on technical and non-technical topics to help new and returning teams prepare for the *FIRST* competition season. Team 1816 was selected to be part of the inaugural *FIRST* President’s Circle, and helped develop “go-to” resources for rookie teams; mentored two *FIRST* Lego League teams; encouraged future scientists through an elementary school science fair, demonstrated the 2007 robot at community events, took part in programs aimed at improving the environment, and mentored *FIRST* teams locally



and worldwide through its Web forum, videos, and email. Team 1816 also volunteered to create, develop and maintain the website for the *FIRST* Minnesota Regional. All of the team's outreach efforts were acknowledged when Team 1816 was awarded the regional Chairman's Award at the inaugural *FIRST* Minnesota Regional, March 2008. The Chairman's Award is the most prestigious award a team can earn, stemming not from being on the winning alliance at a competition, but by reaching out beyond building a robot to the community-at-large. This honor is one that every *FIRST* team strives for because the team that wins it is recognized as having done the most to spread the ideals and goals of *FIRST*, by inspiring young people to become leaders in science and technology. And as robots go, the 2008 robot designed and built for *FIRST* Overdrive succeeded in reaching the quarter-finals at the March 2008 Wisconsin Regional as well as the quarter-finals of the Minnesota Regional. Winning the Chairman's Award earned Team 1816 a trip to Atlanta, where the team was a Galileo Field Participant in the 2008 *FIRST* Robotics Championships, April 2008. The team wrapped up its summer 2008 activities by earning the title of "Minnesota State Fair Robotics Competition Champion" in September.

In Fall 2008, Team 1816 once again was involved with a *FIRST* pilot program. The team was one of only 18 "beta-test" teams in the nation to test the new control system, the Compact cRIO. Beta-test teams put together seminars on the new control system to help ease the transition that teams faced switching to the new technology. The Green Machine collaborated with two other veteran *FIRST* teams -- Team 2220-Blue Twilight, Eagan High School, and Team 2129-Ultraviolet, Southwest High School, Minneapolis -- on six weeks of testing. In November, the three teams presented all they had learned about the cRIO at the University of Minnesota's Willey Hall to regional *FIRST* teams. In early December, Team 1816 also demonstrated the cRIO as the host of a series of pre-season seminars known as "Minnesota Splash." Splash features veteran *FIRST* teams presenting on a variety of relevant *FIRST* robotics topics to new and inexperienced teams. Standing-room only audiences (approximately 500 to 600 people) crowded into Anderson Hall at the University of Minnesota to learn about the cRIO, electrical wiring, pneumatics, marketing, websites, animation, outreach and the Chairman's Award.

The Green Machine in September 2008 helped launch Edina's first-ever *FIRST* Tech Challenge (FTC) team. Team 2887- The Bucket Brigade is composed of students in grades 7 – 9 at Edina's Valley View Middle School. Their robot, "Betty," competed in March 2009 in the Minnesota Snow Drift FTC Regional Tournament, Prior Lake, Minn. The team not only held its own at the tournament, competing against teams composed entirely of high school students, but came away from their first-ever competition with two awards. The PTC Design Award, which recognizes a robot that is both functional and aesthetically-pleasing, and was named a finalist for the Inspire Award, FTC's highest-ranked award. This award recognizes a team's "spirit of gracious professionalism" and inspiration to others.

After finishing in the quarterfinals at the Wisconsin Regional, Team 1816 felt confident an improvement in standing could be accomplished. While "Zeus" entered Wisconsin as a "shooter" with the ability to shoot balls into opponent's trailers, the team decided a dumper would allow the team to score much higher volumes than had been scored



previously. A small group of builders designed and created a dumping mechanism to replace the shooter. The time spent re-building Zeus was well worth it. The Green Machine finished with a 6-1 record in qualification rounds at the Minnesota North Star Regional, placing it in fourth place overall and able to select its own alliance for the elimination rounds. Aided by alliance partners Team 2472-Centennial Sr. High School, Circle Pines, Minn., and Team 2418-Minot, N. D., the team reached the finals. However, Zeus lost in the final match to the second-seeded alliance composed of Team 79-Krunch, Tarpon Springs, Florida; Team 2970-Kenosha, WI, and Team 2549-Millerbots, Washburn High School, Minneapolis.

In addition to success on the playing field, the team did well in non-build related areas. After winning the award at the Wisconsin Regional for “Best Website,” the team repeated, also receiving the award at the North Star Regional. The team also took home their first-ever Autodesk Visualization Award for our animation “Green Power.” Both the animation and website were entered in their respective categories at the *FIRST* Championships in Atlanta in April; at Championships, the website earned a “Web Excellence” award in that round of judging. At the North Star Regional, Mark Lawrence, one of Team 1816’s founding mentors and the Director of Technical Operations, was named the winner of the Woodie Flowers Award, presented by Woodie Flowers himself! The award, named after the *FIRST* cofounder and MIT professor emeritus, celebrates mentors who “lead, inspire, and empower using excellent communication skills.”

MEMBER REQUIREMENTS

Code of Conduct

“Gracious professionalism,” one of the founding precepts of *FIRST*, is essential to team participation. “It’s a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community” (www.usfirst.org).

Disciplinary actions, to be determined by team mentors, may include suspension from team activities, ineligibility to travel with the team, or removal from the team.

1. Students will display “Gracious Professionalism” – the motto of *FIRST* – at all times and promote the ideals of *FIRST*.
2. Students will follow the same rules as dictated by Edina High School and the Minnesota State High School League, including those in regards to alcohol and chemical substances.
3. Students will not violate the racial / religious / harassment / violence / and hazing bylaws of the Minnesota State High School League (MSHSL bylaws available upon request).
4. Students are expected to behave in a courteous and cooperative manner.
5. Students are expected to be respectful of others and behave in a way that protects the health and safety of themselves and others.
6. Students shall be respectful of the facilities, tools, equipment and all things being used by the team.
7. Students shall not use profane, obscene or vulgar language in written, gestured, or verbal form. Edina Robotics abides by Edina Public School’s Acceptable Use Policy for all communications, including all social media and Internet usage (<http://www.edina.k12.mn.us/parents/rights/html>). Students’ Internet/social media/online communications are team communications, and will be regarded as such.
8. Students visiting or working at corporate sites are guests of the corporations and must be courteous and respectful. While at a corporate site, students are expected to follow the general rules and safety rules posted at the site.
9. Students are expected to keep current with team activities and requirements by checking the website and their email frequently.

Student Eligibility

1. Students must be enrolled at Edina High School.
2. Students must maintain a minimum of a C- average.
3. Students are expected to make a significant time commitment to the team, actively participating in meetings, workshops, and events. Commitment to the team increases significantly during the 6-week build in January and February.
4. Students are expected to be reliable (on-time, prepared to work, clean up, positive attitude, assist newer members, responsive to mentors and other adult volunteers) and assist with team administrative tasks.
5. Students and parents must complete the necessary paperwork and pay the required fees including the annual registration fee, t-shirt costs, and travel expenses.



Lettering and School Recognition

1. The faculty advisor and operations director, with input from all team mentors, will determine which students receive a letter and/or school and team recognition awards.
2. Students must be an active participant of the team (absences are noted) and member in good standing for each of two years.
3. Student must attend one competition in its entirety for each of the two years.
4. Student must maintain a minimum of a C- average.

Team Organization

Faculty Advisor:

- A teacher or Edina High School-appointed volunteer who acts as the liaison between the team and the school.
- Monitors the standing of each member (grades, behavior, and attendance).
- Communicates to the schools and schedules school facilities.
- Assists with grant proposals.
- Coordinates yearbook page with school yearbook staff.
- Determines appropriate school and team recognition awards.
- Supervises team activities.
- Serves as “alternate contact” with *FIRST* organization.
- Serves as “shipping contact” with *FIRST* organization.
- Maintains open communication with parents, mentors and students.
- Coordinates parent and adult volunteers for team activities.
- Coordinates mentors for build and sub-team meetings.
- Supervises travel plans for team.
- Co-signer on team checks.
- Supervises handbook updates.
- Maintains registration, attendance, safety contracts, and other private student records.

Operations Director:

- Chief mentor to the team (both robot and business operations).
- Supervises technical mentors.
- Co-signer on checks.
- Is present at competitions and other *FIRST* events.
- Coordinates with Faculty Advisor, Communications Manager and Team Manager on all things detailed regarding *FIRST*.
- This handbook may not contain all possible team procedures and processes, nor can it address all situations coming before the team; the operations director is entrusted with ensuring that there are responsible adults overseeing the ongoing operations of the team.
- Chief arbiter of all team business. Has final approval of all official team communications and functions (including animations, videos, and outreach).

Communications Manager:

- Primary contact with *FIRST*.
- Primary contact with *FIRST* Minnesota Regional Planning Committee.
- Submits registration for *FIRST* events.
- Distributes *FIRST* information to appropriate adult and student team members.
- Oversees communications with community and business partners.
- Maintains team email distribution lists and rosters.
- Maintains team history.
- Works closely with student leaders to update team website, forum and calendar.
- Coordinates building requests with Edina School District.

Technical Mentors:

- Adult volunteers with an engineering or technical background.
- Provide professional expertise and supervision.
- Guide and teach students new skills.

Other Mentors:

- Are adults that direct the team in business, marketing, animation, and media.
- Provide professional expertise, guidance, supervision, or training to students.

All Parents:

- Are expected to provide additional support of the team, including chaperoning, making travel arrangements, providing meals, transportation (people and robot), general supervision (non-mentorship), donation of general supplies/snacks/water, craft-type expertise (including sewing) and assisting team mentors as requested.

Sponsors:

- Are corporations and individuals that contribute funds, services, supplies, or support to the team.

Team Captain(s) And Sub-Team Leaders:

- Are students that lead a group of students on a sub-team.
- Attend mentor/student leader meetings.



- Mentor younger students and set a good example.
- Bring problems to the attention of adults.

Selection of Leadership

The leadership of Team 1816 will be determined by secret ballot voting of the membership at a publicized team meeting and supervised by the Faculty Advisor and the Operations Director.

Students wishing to hold a leadership position must announce their candidacy within the established timeframe via the team web forum and the designated team meeting prior to the voting. All candidates must be members in good standing. The Co-Captain makes a unique two-year commitment to the team as a “shadow” the first year and Captain the second year. All other positions are for a single year. The Captain is not re-voted on in his/her second year. Further, it is strongly recommended that a candidate for sub-team leader have served on that sub-team in the past.

Sub-team leaders and team members are divided into sub-teams based on their interests and expertise. Sub-teams are developed based on the size of the team, the nature of the year’s competition, and the availability of mentors. Every team member is expected to participate in Outreach events. Returning team members are sorted onto sub-teams before new team members are placed. The process will involve a random draw of names, beginning with seniors. Each student will select a position from the available positions. New members will be placed on sub-teams based on an application and interview with the Faculty Advisor, the Operations Director, and team member representatives as selected by the Faculty Advisor and the Operations Director. All team placements will be based on availability of positions.

Description of Leadership, Sub-teams

Captain

Represents Team 1816 in all official capacities, including *FIRST* competitions. Is chief spokesperson for the team. Supervises all business and build activities.

Responsibilities:

Run meetings; make broad sweeping decisions; make shipping arrangements; keep track of what needs to be done for build including monitoring of *FIRST* manuals; prepare BOM – the Bill of Materials (a complete listing of all robot parts and supplies and their exact cost) for *FIRST* competitions and present this BOM at competitions; maintain software licensing; supervise sub-team leaders; maintain ongoing email correspondence; coordinates and communicates regularly with team mentors; includes team’s faculty advisor and operations director in all team decisions.

Time Commitment:

All team meetings; all build days; minimum of 7 hours on *FIRST*-related business weekly, more during build period; all outreach events.

Business Captain



As Team 1816's leader in the solicitation of corporate sponsorships, the Business Captain is responsible for developing and sustaining relationships with the team's sponsors; maintains team's brand identity across all media, formats, materials, forms.

Responsibilities:

Coordinate corporate sponsor presentations and appreciation; work with designated team members on marketing materials, including newsletters and collateral materials (DVDs, fliers, giveaways); supervise team brand identity (logos, t-shirts, robot trailer, mascot); help manage team finances (team treasurer); maintain communication on team web forum and at team meetings; maintain sponsor relations and recognition; prepare grant proposals; coordinate activities with outreach sub-team leader, captain and co-captain; maintain ongoing email.

Time Commitment:

All team meetings; all business sub-team meetings; 5-6 hours per week during non-build season reviewing finances and corporate sponsorship; all outreach events.

Co-Captain

The only two-year position on Team 1816. For first year of term, "shadows" captain to learn how to manage team during second year of term.

Responsibilities:

Arrange jobs for competitions in consultation with Faculty Advisor and Operations Director; collaborate with Business Captain to obtain corporate sponsorships; help organize Outreach and other events; order parts, tools, equipment; help supervise sub-team leaders; coordinate Bill of Materials with Captain and Build sub-teams; maintain ongoing email correspondence; act as captain when the captain cannot be present at events or meetings.

Time Commitment:

All team meetings; all build days; during non-build season about 7 hours per week; all outreach events.

CAD (Computer-Aided Design/Drafting) Sub-Team Leader

Responsible for design of robot's structure, creates CAD models of design, aid in design process, assesses feasibility of design choices, simulates motion and analyzes weight of robot.

Responsibilities:

Give vital input into robot design; model robot on computer using *Solidworks* CAD software; help construct prototypes; supervise sub-team meetings; maintain build log; keep current with Chief Delphi and other *FIRST*-related websites and team web forum; maintain communication with manipulator, chassis and programming subteams.

Time Commitment:

All team meetings, every build session, CAD training during the summer, work with practice robot in summer, outreach events.

Chassis Sub-Team Leader

Leads design, construction, and adjustment of the robot's drive-train system and the skeletal structure of the robot. Monitors Web sites (*FIRST* and Chief Delphi) for vital information and weight control of the robot.

Responsibilities:

Organize and supervise meetings of sub-team; buy parts; supervise work in pit during competitions; coordinate & supervise building of the chassis/drive train; update build log; monitor weight of robot; keep current with Chief Delphi, The Blue Alliance, and team web forum; maintain an ongoing list of materials used in building of robot in preparation for *FIRST* Bill of Materials (a complete listing of all robot parts and supplies and their exact cost) for *FIRST* competitions; maintain a build schedule and keep sub-team to the schedule through supervision and communication; coordinate with CAD, Manipulator, Programming.

Time Commitment:

All team meetings, coordinating and supervising summer practice build, summer workshops/trainings, all build sessions – full time; busy with coordination of activities and communication all year round 2-3 hours per week, outreach events.

Communications (Secretary)

Responsibilities: Oversee internal team communications, meeting minutes, team calendar and schedule; primary content provider (writer) to 1816's website and *Buzzwords* (newsletter published by the Edina Parent Council); may contribute to Minnesota Regional website; coordinate with marketing sub-team leader on writing needs for team marketing materials.

Time Commitment:

All team meetings, writing and communicating all meeting minutes, write stories for Web site(s) on tight deadlines; year-round 2-3 hours per week, outreach events.

Facilities Management Sub-Team Leader

Interprets *FIRST*-supplied blueprints of the playing field and builds parts of the field according to those specifications. Designs and sets-up pit area at competition. Constructs shipping crate.

Responsibilities:

Organize and supervise design and build of all non-robotic materials including: crate, pit, and practice field; design and construct bumpers for robot; manage workshop and inventory of tools; coordinate with marketing the pit design regarding and placement of corporate logos on robot.

Time Commitment:

All team meetings, during summer and fall 2-3 hours per week on pit and crate, during the build season all build sessions until field and crate are constructed, and final pit is designed and ready; outreach events.

Manipulator Sub-Team Leader

Responsible for the design, construction and incorporation of any game-object manipulators (including pneumatics) and sensors on the robot.

Responsibilities:



Organize and supervise meetings of sub-team; buy parts; keep communication flowing with Chassis, CAD, and Programming, particularly during build; supervise work in pit during competitions; coordinate and supervise building of the manipulator; oversee design and build of everything on the robot that is NOT the drive train/chassis; monitor weight of robot; maintain logs; keep current with Chief Delphi, The Blue Alliance, and team web forum; maintain ongoing list of materials used in building manipulator in preparation for *FIRST* Bill of Materials (a complete listing of all robot parts and supplies and their exact cost) for *FIRST* competitions.

Time Commitment:

All team meetings, summer workshops/training, summer practice robot, all build sessions, 2-3 hours per week on planning/communication year round, outreach events.

Media Sub-Team Leader

Coordinate team photography, team video and DVD production, website, and animations. Develops, maintains, and submits website and other media projects for competition entry.

Responsibilities:

Build and maintain team's website; coordinate/execute the filming and editing of marketing and other promotional videos; maintain team's "You Tube" page; coordinate the taking/editing/filing of pictures from all team events; collect and manage all team media from other sources; supervise and coordinate production of team animations (Safety, Visualization, and other themed animations) using Autodesk 3D StudioMax software; coordinate as needed with Business Captain; liaison with professional media.

Time Commitment:

All team meetings, year round responsibilities. Busiest during team events, kick-off, and competitions; two to eight hours/week, up to 5-15 hours/week during build/design periods, all team/outreach events and competitions.

Outreach Sub-Team Leader

Promotes technology and engineering through various activities. Coordinates events, seminars and activities to raise awareness of *FIRST*; assists other FRC, FTC and FLL teams.

Responsibilities:

Organize and supervise outreach events and projects; handle all tasks associated with Chairman's Award submission, including essay, scripts, visual aids; coordinate with Business Captain on fundraising activities (car wash, et al.).

Time Commitment:

All team meetings, year round Outreach activities. Outreach events diminish during build, when Chairman's Award preparations take precedence. On average, 4-6 hours per week, year-round.

Programming Sub-Team Leader

Designs and builds robot electronics, wiring, circuitry, and sensor systems. Develops and updates robot computer programs (C++, LabVIEW, Java, et al).

Responsibilities:

Plan and supervise sub-team meetings; keep current with Chief Delphi; assure all programmers learn how to and participate in programming; program the robot; work on wiring in conjunction with manipulator and chassis sub-teams; program and wire practice robot in the summer; maintain communication with CAD, manipulator and chassis sub-teams, both verbally and electronically.

Time Commitment:

All team meetings, summer programming workshops and practice robot build sessions, weekly sub-team meetings until build; then 4-5 days a week during actual build; attend outreach events.

Safety Captain

This position is requested by FIRST for all FRC Teams. See:

<http://www.usfirst.org/roboticsprograms/frc/content.aspx?id=470&terms=Safety+Captain>

Responsibilities:

Plan and deliver team safety seminar at beginning of season; be Safety Captain and Pit Boss at all competitions; distribute and collect safety glasses; buy safety glasses and other safety equipment; monitor websites (*FIRST*, Chief Delphi) for vital information, tools management. Download and print-out current year safety manual, including safety (MSDS) information about batteries. Coordinate work with Facilities Management sub-team on safety plan/equipment for pit; supervise the safety of the workshop during build sessions.

Time Commitment:

All team meetings, limited activity during the summer, safety seminar plan and execution takes 8-10 hours, supervision of workshop safety during build intermittent 2-3 hours/week; attend all competitions, and outreach events.

Scouting Leader (position assigned by team leadership)

Responsibilities:

Organize pre-scouting activities; develop scouting database and data collection system; assign and coordinate scouts during competitions; monitor The Blue Alliance, Chief Delphi, and other *FIRST*-related websites and Forums; prepare database of teams/capabilities during competition; and preparation/delivery of scouting report. Must stay current on all game rules and communicate information to team. In cooperation with Business Captain, organize and coordinate team spirit (team mascot) at competitions, including peer-to-peer awards given to other FRC teams at competitions; oversees team giveaway items (i.e. roborags, yo-yos).

Time Commitment:

All team meetings, preparation begins when teams are posted before each competition – 3-4 hours per week for regional competitions and more for national competition, all competitions, and outreach events.



Business Functions

Outreach	Promotes technology and engineering through various activities. Coordinates events, seminars and activities to raise awareness of <i>FIRST</i> ; and assists other FRC, FTC and FLL teams. Includes organization of team activities and fund-raisers outside of corporate sponsorships.
Corporate fundraising	Responsible for soliciting sponsors. Maintains sponsor relations and recognition before, during, and after the building phase (see detailed sponsor information). Prepares grant proposals, and obtains other commercial donations of supplies and services.
Marketing	Provides marketing collateral materials, including logos, t-shirts, team giveaways. Supervises team brand identity, including t-shirts and mascot.
Finance	Team members work in conjunction with adult financial consultant.
Media	Coordinates team photography, team video and DVD production, website, and animations. Develops, maintains, and submits website as well as other media projects for competition entry.
Animation	Produces Safety, Visualization, and other themed animations using Autodesk 3dStudioMax software.
Communications	Oversees internal team communications, meeting minutes, team calendar and schedule. Is primary content provider to team's website; contributor to school newsletter(s). Coordinates team newsletter(s) and other team communications.

Build Functions

CAD	Responsible for design of robot's structure, creates CAD models of design, assesses feasibility of design choices, simulates motion and analyzes weight of robot.
Drive-train and chassis	Responsible for designing, constructing, and adjusting the robot's drive-train system and the skeletal structure of the robot. Monitors Web sites (<i>FIRST</i> and Chief Delphi) for vital information and weight control of the robot.
Electrical, sensors and programming	Responsible for electronics, wiring, circuitry, and sensor systems. Develops and updates robot computer programs.
Facilities Management	Interprets <i>FIRST</i> -supplied blueprints of the playing field and builds parts of the field according to those specifications; designs and sets-up pit area at competition. Constructs shipping crate. Manages and maintains school workshop area and team tools.
Manipulator	Responsible for the design, building and incorporation of any manipulators (including pneumatics) and sensors on the robot.
Safety	Safety captain and designated team members monitor competition manual for robot compliance and safety considerations. Coordinates team's annual safety seminar. Monitors Web sites (<i>FIRST</i> and Chief Delphi) for vital information, tools management & inventory of parts.
Strategy, Scouting & Spirit	Includes game rule monitor(s), provides competitive information for the competition team prior to and during competition, and develops scouting database and data collection system. Leads spirit at competition, including team peer-to-peer interactions and mascot.

Team Organization – During Competitions

Pit crew positions	<p>Students may rotate in and out of the pit.</p> <ol style="list-style-type: none">1. Mentor (type will vary).2. Safety captain – student in charge of safety glasses, cleanliness of pit, keeping aisles clear, monitoring persons in the pit.3. Mechanical – student(s) in charge of drive-train, chassis and manipulator.4. Electrical – student in charge of electrical pre- and post-match checklist as well as keeping batteries charged.5. Programming – student programmer responsible for system checks and programming changes.6. Runner – student in charge of acquiring any items needed including tools, parts, help, etc. Coordinates communication in and out of pit and rotation of pit crew.
Field crew	<ol style="list-style-type: none">1. Driver – *student operating the robot using the remote controls.2. Coach – student providing feedback during the game.3. Human player – student participating in the game as a human player.4. Other (such as robot accessory operator). <p><i>*Driver(s) will be determined by pre-competition try-out, possibly using the previous year's robots.</i></p>
Media crew	<ol style="list-style-type: none">1. Digital photographer2. Videographer3. Updates Web blog with competition news4. Seminar Coordinator
Awards crew	<ol style="list-style-type: none">1. Pit rep – talks to judges2. Chairman's Award – 3 students responsible for team interview and presentation before judges
Scouting and Spirit Crew	<ol style="list-style-type: none">1. Strategy Lead – coordinates scouts and presents conclusion.2. Data input – updates information to database.3. Collectors – watch matches and collect needed information.4. Robot Documenter – photographs and collects basic data on all robots at the competition.5. Mascot (wears costume, leads cheers).6. Peer-to-Peer Awards.7. Team representatives as requested by <i>FIRST</i> as guides and hosts to visitors.

FUNDING AND FINANCIALS

Funding for the Edina Robotics Team comes from these sources:

1. Corporate and Educational Sponsors – corporations, education-related and other non-profit organizations that donate funds. This constitutes the majority of the funds. Our sponsor levels for the 2008 season are noted in the section that follows:
2. Team member registration fee, travel expenses (transportation, hotel, and meals), t-shirt costs, field trip expenses, and miscellaneous costs are all funded by the team member. The typical cost per student is \$500 to \$1,200 depending on the student’s travel. Scholarships are available. Please see Faculty Advisor.

Team 1816 thanks its corporate sponsors for their ongoing support of their participation in the *FIRST* Robotics Competition. Every year, the team must solicit corporate sponsorships and donations to support a \$30,000+ budget to design and build a competition-ready robot. This budget does not include travel expenses to up to two regional competitions and/or the Championship event in Atlanta, GA. Listed here are a few of the budget line items:*

<i>FIRST</i> registration (entitles team to robot kit-of-parts and one competition)	\$6,000
Each additional regional event attended registration fee	\$4,000
Championship competition registration fee (if qualified)	\$5,000
Playing field construction	\$1,000
Robot construction	\$3,000
Computer hardware, software	\$5,000
Team promotional items (banners, giveaways, mascot, fliers, etc.)	\$3,000
Administrative costs (video, website fees, photocopies, postage, etc)	\$2,000
Outreach events (trailer, hitch, presentation materials)	\$5,000
Total:	\$34,000

*This estimate includes two regional competitions and one Championship competition. It does **not** include travel costs for students, mentors, chaperones. All competitions require travel.

Sponsorship Levels

Level	Amount
Platinum Sponsor	\$15,000 and up
Gold Sponsor	\$10,000-\$14,999
Silver Sponsor	\$5,000-\$9,999
Bronze Sponsor	\$1,000-\$4,999
Contributor	\$1,000 or less



SAFETY

1. Team members will act in a safe manner AT ALL TIMES. This includes during any team-related activity while traveling to team events, and during competitions.
2. Team members will be respectful of the Safety Captain(s) and adhere to any reasonable requests made by the Safety Captain(s).
3. Team members will be expected to attend a safety seminar and pass a Safety Quiz. Power tools or equipment may only be used under the supervision of an adult mentor.
4. Team members will be expected to wear safety glasses at work sites and in the pit area at all competitions. In addition, team members may be asked to wear gloves, face masks, and ear protection during certain tasks.
5. Horseplay will not be tolerated at any time.
6. All work areas will be cleaned up at the end of every day including sweeping the floors and work surfaces, putting away tools and materials, and throwing away trash.
7. Students will not socialize or linger in the workshop once the designated task(s) are completed.
8. Team members will not directly or indirectly give out personal information about themselves or other team members while using any form of online/Internet communications or media. This includes all social media (Twitter, Facebook, et al), Team 1816, other *FIRST* teams or other *FIRST*-sponsored Forums, wikis or any Internet/Web/mobile device (cellphones). As Team 1816 members, students' communications through any media are representative of the team and should not negatively reflect on the team and should at all times reflect the tenets of *FIRST* and "Gracious Professionalism."

SEASON CALENDAR

September, 2009	<ul style="list-style-type: none">• <i>FIRST</i> releases its calendar of events and other competition information.• Team organization begins, returning members' registration confirmed.
October – December, 2009	<ul style="list-style-type: none">• Team meetings: Regular team meetings will be held in Room 213, Valley View Middle School. Sub-team meetings and/or other group sessions are scheduled as needed. The web calendar is regularly updated, check often.• Special events include Minnesota Splash, training sessions, field trip(s), guest speakers, Homecoming parade.
January 9, 2010	<ul style="list-style-type: none">• <i>FIRST</i> Kick-off at University of Minnesota
January 9-February 23, 2010	<ul style="list-style-type: none">• The 2010 Build Season• Work sessions and meetings daily.
March-April, 2010	<ul style="list-style-type: none">• <i>FIRST</i> Regional competitions• Wisconsin Regional: TBA 2010.• Minnesota North Star Regional: <i>The dates of the Minnesota Regional will coincide with Edina's Spring Break. Please plan accordingly.</i>
April, 15 – 17, 2010	<ul style="list-style-type: none">• Championship competition in Atlanta
May, 2010	<ul style="list-style-type: none">• Sponsor recognition, school recognition and post-season team celebration
June-August, 2010	<ul style="list-style-type: none">• Summer activities may include training, community outreach, and corporate fundraising.

TEAM TRAVEL

Travel

Students are expected to attend the *FIRST* Minnesota Regional, and are given the opportunity to travel to other competitions, including Atlanta, GA (if team qualifies to participate at the Championship). All transportation, hotel and meal expenses are paid by each student and adult traveling with the team. Travel itinerary and information will be provided mid-season. Student **MUST** attend a **FULL** Competition (in its entirety) each year for two years to meet lettering requirements.

Expectations of student while traveling

- Be a member in good standing (see Member Requirements).
 - Pay for their transportation, and hotel (in advance), and meals while there. (*Scholarships are available*).
 - Arrange ahead of time with their teachers to make-up any work missed (students will miss Wednesday, Thursday and Friday of school for competitions).
 - Complete all necessary paperwork for travel (permission slips, *FIRST* consent form, medical and health liability release, student behavior expectation form, etc).
 - Attends mandatory travel meeting(s).
 - Abide by all rules of conduct for traveling with the team (to be distributed prior to traveling).
 - Exhibit team spirit and “Gracious Professionalism” at all times while traveling.
-

COMMUNICATIONS AND RESOURCES

Communications expectations:

All team members and mentors are required to have an email address (Google's Gmail is the preferred email server) and check it daily. In addition, the team website, including the forums, blog, and calendar, should be checked frequently.

Any distributed roster of the team members, parents, and mentors is designated as for *team use only*.

General Team contact: contact@edinarobotics.com

Resources:

www.edinarobotics.com = Edina Robotics team website, includes:
news
calendar
parent resources (Note: the Parent Resources page on the website is team-only. An approved account is needed to access this section as well as the Forum).
team-only Forum (Note: Team members will need an approved account in order to access this section of the website.)

www.mnfirstregional.org = official website of the *FIRST* Minnesota Regional Competition includes
upcoming events,
information about *FIRST* Robotics in Minnesota.

www.usfirst.org = official website of the *FIRST* Robotics Competition (FRC), includes:
- information about *FIRST*,
- information about *FIRST* Robotics Competition,
- video of last year's championship games,
- competition manual.

www.chiefdelphi.org = a website of a veteran team with helpful information and forums on many topics.

www.thebluealliance.net = a website that archives videos of previous years' competitions and source of much helpful information.

www.firstnemo.org = a website with information for non-engineering mentors.

