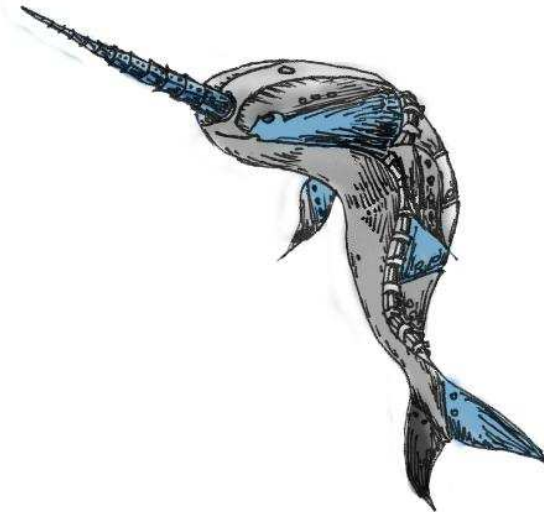


***ALUMINUM NARWHALS***  
***Team 3128***



***TEAM HANDBOOK***  
***2009-2010***

# ALUMINUM NARWHALS TEAM 3128 HANDBOOK 2009-10

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## WELCOME

Congratulations on joining the Canyon Crest Academy FIRST Robotics Competition (FRC) Team 3128. We think you will find your experiences very rewarding. This handbook is intended to give you an understanding of the program and your responsibilities as a team member. In the following pages, you will find information relating to team membership, organization, expectations, activities, events, travel, finances and many other areas of interest. Please review all of the information very carefully. If you have any questions that this guide has not covered, or if there are questions regarding any robotics topic, do not hesitate to ask a mentor. You are encouraged to share this manual with your parents, and keep it handy for future reference.

## MISSION

The mission of the Canyon Crest Academy Aluminum Narwhals is to provide a positive high school team experience through robotics while inspiring intellectual creativity, fostering a passion for science, technology and engineering, and developing critical thinking, problem solving and team building skills.

## *FIRST* ROBOTICS

The Canyon Crest Academy Robotics Team is a part of *FIRST* Robotics. *FIRST* (For the Inspiration and Recognition of Science and Technology) is a notational nonprofit organization that strives to help high school students get a glimpse of the world of science and engineering, ultimately assisting them to choose a career in a technical field. This is accomplished through building a robot and competing in tournaments, allowing students to interact with professionals in many fields. It is our goal to help team members:

- Gain an interest in the different fields of science and engineering
- Develop leadership skills
- Develop overall character
- Develop critical thinking and problem-solving skills
- Build self-confidence
- Learn to work in a team environment
- Prepare students for real-world situations
- Demonstrate gracious professionalism at all times

## GRACIOUS PROFESSIONALISM

*Gracious Professionalism is part of the ethos of FIRST. It's a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. With Gracious Professionalism, 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. They avoid treating anyone like losers. No chest thumping tough talk, but no sticky-sweet platitudes either. Knowledge, competition, and empathy are comfortably blended. In the long run, Gracious Professionalism is part of pursuing a meaningful life. One can add to society and enjoy the satisfaction of knowing one has acted with integrity and sensitivity.” –usfirst.org*

## TEAM MEMBERSHIP

### GENERAL TEAM MEMBERSHIP

CCA Robotics Team 3128 has an open door policy to any student at CCA, regardless of experience. The Team actively encourages students to join the team and share in the excitement of learning and working in an engineering environment. Students should begin attending team meetings during the first week of the school year. Important training sessions in every area of the team begin in September. Students who join the team after November 1 of the school year will be accepted only by application and only on a case by case basis.

## OPPORTUNITIES

### CERTIFICATE OF MERIT

Students may receive a Certificate of Merit in Robotics for outstanding service to the Team. The Certificate is intended to signify effort beyond the ordinary. To be eligible to receive a Certificate in Robotics at Canyon Crest Academy a student must meet the following requirements:

1. One complete year of involvement on the team
2. Excellent attendance record at team meetings/functions
3. Attendance at one or more *FIRST* sanctioned competitions
4. Provide a minimum of 10 hours of related community service or mentoring to an FLL or FTC team.

Certificates will be awarded upon completion of the above criteria. Team members may receive Certificates for each of their years of involvement.

### SCHOLARSHIPS

There are many scholarship opportunities associated with the *FIRST* program. By being an eager participant in the *FIRST* Robotics program, students can qualify for many scholarships. Through

*FIRST*, more than \$12 Million dollars in scholarships are given out through more than 59 colleges and universities in the US and Canada. Moreover, *FIRST* is a much respected organization among many top universities in the US, and participation in *FIRST* Robotics will increase a student's chances of getting in and acquiring scholarships.

During their junior year, it is important for students to concentrate on the skills needed to score high on the ACT and SAT tests. College entrance and many scholarships are based upon these scores, as well as high school transcripts. The higher a student's test scores and GPA, the more funds will be available for his/her education.

Scholarship opportunities for the new *FIRST* Robotics Competition season are typically finalized and posted by September 30. The deadline for scholarship application submissions is typically early to mid-March. Scholarship contributors typically select recipients by early April and notify *FIRST* of the recipients' names and team numbers. Scholarship recipients will be recognized at the *FIRST* Robotics Championship Competition in mid-April.

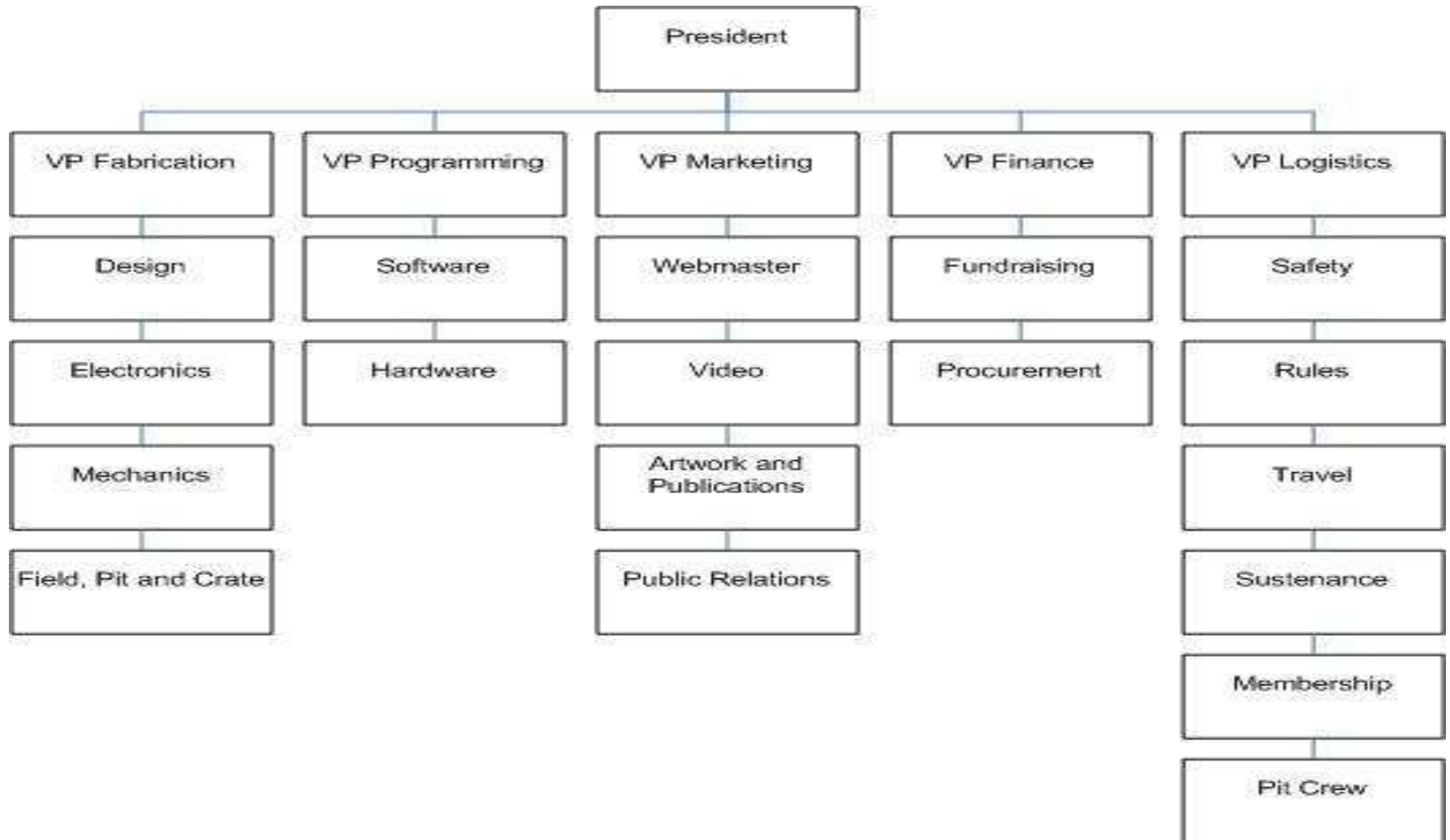
## TEAM ORGANIZATION

### TEAM STRUCTURE

Team 3128 is operated as a business with an executive team, a management team, a travel team and general membership.

ORGANIZATIONAL CHART (SEE FOLLOWING PAGE)

**CANYON CREST ACADEMY ROBOTICS TEAM  
ORGANIZATIONAL CHART**



## JOB DESCRIPTIONS

### *President*

The President is responsible for all aspects of the team management and operations. The President acts as a liaison between the teacher advisor, the lead mentor and the executive and management teams. The President acts as the team spokesperson at all public events and will schedule and manage all executive and team meetings. The Vice President of Fabrication, the Vice President of Programming, the Vice President of Marketing, the Vice President of Finance, the Vice President of Logistics, the Vice President of Competition and the Vice President of Community Outreach all report to the President.

### **Fabrication**

#### *Vice-President, Fabrication*

The Vice President of Fabrication is responsible for all aspects of the management and operations of the Fabrication Department. This person serves as a part of the executive leadership team and reports directly to the President. He/she works closely with the engineering department to fabricate their designs. All requests for robot parts and supplies must be approved by this person. He/she supervises the fabrication of all items in the shop. The Robot Fabrication Manager and the Pit and Field Fabrication Manager report to this person.

#### *Design Manager*

The Design Manager is responsible for creating a list of functional specifications for the robot as quickly as possible, based on the strategy developed by the team. The design team will be responsible for the design of the chassis, robot subsystems, and electrical/control requirements. The design team will create an initial drawing of the robot and provide design ideas to the prototype team for testing. Engineering, manufacturing, and other resources will be prioritized and may be reassigned for the timely completion of the robot.

#### *Mechanics Manager*

The Mechanics Manager is responsible for designing the robot chassis, as well as coordinating the location of the various components to be mounted on the chassis and monitoring the weight and center of gravity of the robot. They are also responsible for the pneumatic equipment, including the compressor, storage tanks, controls, valves, and tubing. This sub-team is also responsible for designing and building the drive train, including the selection of motors, gearbox/shafts/chains and wheels. This group is responsible for meeting the specifications and functions defined by the engineering team. They report to the Fabrication Vice-President.

#### *Electronics Manager*

The Electronics Manager is responsible for wiring all motors, compressor, motor controllers, relays, etc. It is their responsibility to ensure that all of the electrical rules have been followed and that the wires are properly labeled and neatly arranged for ease of maintenance. This group is responsible for meeting the specifications and functions defined by the engineering team. They report to the Fabrication Vice-President.

### *Field, Pit and Crate Fabrication*

The Field, Pit and Crate Fabrication Manager will oversee the fabrication of all non-robot items including the pit structure, practice field structure, robot transportation cart, and shipping crate. He/she will prepare all initial requests for pit and field materials and parts. The pit and field team will be responsible for assembly of the pit structure at events. The Pit and Field Fabrication Manager will report to the Vice President of Fabrication, Marketing and Competition.

### *Safety Manager*

The Safety Manager is responsible for maintaining a safe working environment on campus and at events. He/she will be familiar with all safety regulations, develop safety handouts, monitor compliance, and develop a program to encourage compliance with safety regulations. He/she will provide information on safety issues to animators and prepare information for the reports and awards team to use for the safety award submission. The Safety Manager will report to the Vice President of Fabrication.

### *Rules Manager*

The Rules Manager is responsible for understanding and enforcing all parts, materials, fabrication, and game rules during the build and competition season. He/she is responsible for communicating with the mechanical, electrical and control groups to make sure that, from the initial design, no illegal materials, parts, or methods are used. He/she will oversee the purchase of all components and raw materials for the robot. The rules team will develop a method for selecting the drive team and pit crew. The Rules Manager will report to the Vice Presidents of Fabrication and Logistics.

## **Information Technology**

### *Vice-President, Programming*

The Vice President of Information Technology is responsible for all aspects of the management and operations of the Information Technology Department. He/she will oversee the programming of the robot and the use of all electronic equipment, computers, and computer programs for the team. This person serves as a part of the executive leadership team and reports directly to the President. The Software Manager and the Hardware Manager report to this person.

### *Software Manager*

The Software Manager is responsible for the development of the code for the autonomous and radio-operated functions of the robot. He/she is responsible for the training of the team in JAVA programming language (and LabView Software) during the off-season and the actual programming of the robot during the build season. This team is also involved in the use and workings of various sensors, controls, and electronics. This team will work with the engineering and fabrication teams. The Software Manager will report to the Vice President of Programming.

### *Hardware Manager*

The Hardware Manager is responsible for the maintenance of all electronic equipment and computers to be used by the team. He/she will ensure that all equipment functions properly and

that all computer programs are functioning and accessible to the team. The Hardware Manager will report to the Vice President of Programming.

## **Finance**

### *Vice-President, Finance*

The Vice President of Finance is responsible for all aspects of the management and operations of the Finance Department. He/she serves as a part of the executive leadership team and reports directly to the President. He/She will set the annual budget and track expenses. He/she will be responsible for the creation of the Bill of Materials for presentation to the judges. All procurement requests must be approved by the Vice President of Finance prior to submission to the President. The Fundraising Manager, the Procurement Manager, the Budget Manager and the Corporate Presentations Manager report to this person.

### *Fundraising Manager*

The fundraising manager will oversee all fundraising activities. He/she will take the lead in contacting corporate sponsors and ensure follow-up on all potential donors. He/she will help prepare all grant proposals. He/She will manage all local fundraising events. The Fundraising Manager will report to the Vice President of Finance.

### *Procurement Manager*

The Procurement Manager will be responsible for reviewing all requests for materials and parts to ensure that they are complete and meet budgetary constraints. He/she will forward all properly documented requests to the Vice President of Finance for final approval and will work with the appropriate department to facilitate the purchase, including arranging for payment of the needed items. This person reports to the Vice President of Finance.

### *Budget Manager*

The Budget Manager will set the annual budget and track all income and expenses. He/she will be responsible for the creation of the Bill of Materials for presentation to the judges. The Budget Manager will report to the Vice President of Finance.

### *Corporate Presentations Manager*

The Corporate Presentations Manager is responsible for identifying, contacting and arranging to meet with potential corporate sponsors. Working with the Vice Presidents of Finance, Marketing and Community Outreach, the Corporate Presentations Manager will travel to corporate sponsors or potential corporate sponsors and give presentations on the team and FIRST. This person reports to the Vice President of Finance.

## **Marketing**

### *Vice-President, Marketing*

The Vice President of Marketing is responsible for all aspects of the management and operations of the Marketing Department. He/she is responsible for developing a marketing plan and overseeing its implementation. This person serves as a part of the executive leadership team and

reports directly to the President. The Web Design Manager, the Photography Manager, the Video Manager, the 3-D Animation Manager, the Arts and Graphics Manager and the Promotions Manager report to this person.

#### *Web Design Manager*

The Web Design Manager is responsible for the design, maintenance, and updating of the team's website. He/she will supervise the team's work to ensure that it satisfies the requirements of the marketing plan. He/she is responsible to review and approve all content prior to submission to the Vice President of Marketing. The Web Design Manager will report to the Vice President of Marketing.

#### *Photography Manager*

The Photography Manager is responsible for all digital still photography to be used by the team. He/she will ensure that a photographer is at all major team functions to document the team's activities throughout the year. He/she will work with the marketing and public relations teams to ensure they have the still images they need for their products. All photos produced by the photography team must be professional and represent the team as whole. The Photography Manager will report to the Vice President of Marketing.

#### *Videography Manager*

The Videography Manager is responsible for all audio/video to be used by the team. He/she will ensure that a photographer is at all major team functions to document the team's activities throughout the year. He/she will work with the marketing and public relations teams to ensure they have the video images they need for their products. All videos produced by the photography team must be professional and represent the team as whole. The video team will also provide footage to the drive team that allows for analysis of our robot and competing robots at tournaments. This video will be reviewed by the drive team and pit crews immediately upon the conclusion of the seed rounds in which the robots participated. The information gathered will allow the team to analyze each robot's performance as well as strategies used to play the game. The Videography Manager will report to the Vice President of Marketing.

#### *3-D Animation Manager*

The 3-D Animation Manager is responsible for the timely production of animation clips for submission to *FIRST*. He/she will coordinate the activities of the animation team to ensure that quality products are created, polished, and entered in a timely manner. The animation team will use the software provided by *FIRST* to create an animation based on the *FIRST* animation rules. The 3-D Animation Manager will report to the Vice President of Marketing.

#### *Art and Graphics Manager*

The Art and Graphics Manager is responsible for the production of artwork and computer graphics for the team. He/she will ensure that ideas generated by the team will be translated into professional end-products. The team will produce the artwork for such items as the website, banners, signs, posters, buttons, and business cards. The Art and Graphics Manager will report to the Vice President of Marketing.

### *Promotions Manager*

The Promotions Manager is responsible for the team's visual appearance and the development of marketing materials. He/she will supervise the development and execution of materials to showcase the team's theme. The promotions team will work on posters, displays, promotional gimmicks, and team uniforms. They are in charge of decorating the pit in a creative and professional manner that will draw attention to the team. The Promotions Manager will report to the Vice President of Marketing.

## **Logistics**

### *Vice-President, Logistics*

The Vice President of Logistics is responsible for all aspects of the management and operations of the Logistics Department. He/she is responsible for organizing the logistics team to provide support in the areas of travel, food for the build season, and robot shipping. This person serves as a part of the leadership team and reports directly to the President. The Travel Manager, the Transportation Manager, the Sustenance Manager, the Shipping Manager, the Recruitment and Membership Manager and the Training Manager report to this person.

### *Travel Manager*

The Travel Manager will be responsible for coordinating all activities related to team travel. He/she will be responsible for the travel team selection process. He/she will also organize transportation to and from events, coordinate chaperones, make hotel arrangements, and coordinate team activities while at events. The Travel Manager will be responsible to ensure that all permission slips, driver forms, insurance certificates, and release forms have been turned in prior to travel. The Travel Manager will report to the Vice President of Logistics.

### *Sustenance Manager*

The Sustenance Manager will be responsible for the coordination of snack food arrangements for team meetings and meals for the fabrication team during the build season. He/she will ensure that parents have signed up to bring food on meeting and build days and remind them ahead of time. The Sustenance Manager will report to the Vice President of Logistics.

### *Shipping Manager*

The Shipping Manager is responsible for making shipping arrangements for the robot. He/she will work with FedEx and the drayage company to ensure that the robot is shipped on time and that it gets from one regional event to the other and then back home. Shipping costs will be coordinated with the procurement team. The Shipping Manager will report to the Vice President of Logistics.

### *Recruitment and Membership Manager*

The Recruitment and Membership Manager is responsible for the team's efforts to recruit new members to the team through the Daily Bulletin, Club Day, and other campus communications. If specific positions need to be filled, the Recruitment Manager will make every effort to find a student to fulfill the position. He/She is also responsible for taking attendance at all team

meetings and events and updating and maintaining the Membership Roster and Team Organizational Chart. The Recruitment and Membership Manager will report to the Vice President of Logistics.

#### *Training Manager*

The Training Manager is responsible for coordinating and providing training opportunities for the team and new recruits. He/she will coordinate training in the areas of programming, SolidWorks, safety, and shop procedures. The Training Manager will report to the Vice President of Logistics.

### **Community Outreach**

#### *Vice President, Community Outreach*

The Vice President of Community Outreach is responsible for all aspects of the management and operations of the Community Outreach and Public Relations Department. He/she will coordinate the dissemination of information to newspapers, radio stations, TV stations, CCA students, service clubs, schools, businesses, and elected officials. This person serves as a part of the executive leadership team and reports directly to the President. The Mentoring Manager, the Press/Media Release Manager, the campus Communications Manager, the Public Events Manager, and the Mascot report to this person.

#### *Mentoring Manager*

The Mentoring Manager is responsible for the FTC and FLL Mentoring Teams that work with Middle and Elementary schools. The Mentoring Manager is responsible for identifying, contacting and arranging outreach events at potential schools that would like to set up an FTC or FLL team. The Mentoring Manager reports to the Vice President of Community Outreach.

#### *Press/Media Releases Manager*

The Press/Media Release Manager is responsible for contacting media personnel to cover team activities. He/she will send out press releases, contact media personnel, arrange dates to meet, set-up interviews, prepare interviewees, and assist the media personnel throughout their visits. The Press/Media Release Manager will report to the Vice President of Community Outreach.

#### *Campus Communications Manager*

The Campus Communications Manager is responsible for all forms of communication on the CCA's campus. He/she will prepare announcements for the Daily Bulletin, handle team communications, contact parents about upcoming events, and advertise on campus. He/she will ensure that all forms of communication represent the team in a professional manner and include visual representations of its main sponsors. The Campus Communications Manager will report to the Vice President of Community Outreach.

#### *Public Events Manager*

The Public Presentations Manager is responsible for all presentations made in public. He/she will coordinate presentations before service clubs, schools, businesses, and elected officials. The

public presentations team will provide representatives to speak with *FIRST* judges, members of other teams, and members of the public at the Regional Tournaments. The Public Presentations Manager will report to the Vice President Community Outreach.

#### *Mascot*

The Mascot is responsible for wearing the mascot costume at all competitions and community outreach events. The Mascot will always act in an upbeat and charming manner to all members of the team and public with the goal of entertaining and spreading the message of the team and FIRST. The Mascot will report to the Vice Presidents of Community Outreach, Marketing and Competition.

## **Competition**

#### *Vice-President, Competition*

The Vice President of Competition is responsible for all aspects of the management and operations of the Competition Department. He/she is responsible for the drive team, pit crew, scouting team, spirit team and awards team, and will supervise the development of the process for selecting the drive team and pit crew members. He/she is also responsible for the preparation of awards and reports. This person serves as a part of the leadership team and reports directly to the President/CEO. The Drive Team Manager, the Pit Crew Manager, the Scouting Manager, the Spirit Manager, the Awards Manager, and the Team Outreach Manager report to this person.

#### *Drive Team Manager*

The Drive Team Manager will be responsible for the selection of the drive team, in accordance with the established process. He/she will ensure that the drive team coordinates with robotics teams from other schools at the events. The drive team consists of a chassis driver, an arm operator, a human player, and a strategy coach. A competitive process will select the drive team. The drive team is required to stay with the robot a majority of the time at the competitions. They will also arrive early and stay late to practice at the competitions. The Drive Team Manager will report to the Vice President of Competition.

#### *Pit Crew Manager*

The Pit Crew Manager is responsible for the organization and operation of the pit crew at competitions. He/she will ensure that the pit crew has the resources and information it needs to do its job. He/she will direct all operations within the pit and will have responsibility for maintaining a safe working environment. The pit crew will be responsible for all maintenance, repairs, and fabrication of parts for the robot while at an event. The Pit Crew Manager will report to the Vice President of Competition.

#### *Scouting Manager*

The Scouting Manager will be in charge of the scouting team at the competitions. He/she will be responsible for devising the method for collecting and sharing information on other robotics teams with the drive team. The scouting team will prepare scouting reports for each team at the competition and share that information with the drive team to assist them in devising alliance

strategies.. They will also prepare a ranked list of competitors for the purpose of choosing alliance partners in the final rounds. They may recruit students and mentors from other groups to assist in this responsibility. The Scouting Manager will report to the Vice President of Competition.

#### *Spirit Manager*

The Spirit Manager is responsible for displays of team spirit while at an event. He/she will coordinate team cheering for our team and other teams, as well as supervise team members to ensure proper decorum. The spirit team will coordinate other unique spirit activities including visiting alliance teams to present them with tokens of appreciation. The Spirit Manager will report to the Vice Presidents of Marketing and Competition.

#### *Awards Manager*

The Awards Manager is responsible for preparing and submitting all awards applications and year-end reports. He/she will coordinate with all sub-teams to ensure that all information has been gathered for publication. He/she will be responsible for the content of the submissions and reports and will ensure that all deadlines are met. The Reports and Awards Manager will report to the Vice Presidents of Competition and Marketing.

#### *Team Outreach Manager*

The Team Outreach Manager is responsible for the distribution of marketing materials to other teams prior to and at events. He/she will identify and make contact with all of the teams that will be participating at the same regional tournaments as our team. He/she will coordinate efforts to make our team known by other teams. The Team Outreach Manager will report to the Vice Presidents of Competition and Marketing.

### DEPARTMENTAL AUTONOMY/INTERACTION

Each vice president will be held accountable for the quality of the products generated by the team members in his/her department. Although communication and interaction between departments is necessary to coordinate activities, each department will maintain autonomy over its own decision-making process. Coordination of departmental activities will take place during executive team leadership meetings.

### TEAM ELIGIBILITY

#### EXECUTIVE LEADERSHIP TEAM

The executive leadership team consists of the President and the five vice-presidents. To be eligible to participate on the CCA Robotics executive leadership team, students must have participated on the team for one full school year, have a minimum 3.25 GPA, and must not be failing in any of their classes. If, at any time, a student's GPA falls below 3.25, he/she will be placed on probation and will have four weeks

to bring the GPA back up to 3.25. If, at the next four-week grading period, the GPA is not at least 3.25, the student will be asked to step down from the leadership team.

## MANAGEMENT TEAM

To be eligible to participate on the robotics management team, students must have participated on the team for one full school year, have a minimum 3.0 GPA, and must not be failing in any of their classes. If, at any time, a student's GPA falls below 3.0, he/she will be placed on probation and will have four weeks to bring the GPA back up to 3.0. If, at the next four-week grading period, the GPA is not at least 3.0, the student will be dropped from the management team.

## TRAVEL TEAM

### *ATTENDANCE*

To be eligible to travel with the team to robotics events outside of San Diego County, students must have at least 90% attendance at team meetings for the full school year and must attend all local team events and activities.

### *SELECTION CRITERIA*

The Canyon Crest Academy Robotics Team is a unique team of students and adults. We all rely on each other for the success of the group. We will consider the following when making our selection for the Travel Team:

1. *Consistent Demonstration of Good Judgment and Positive Behavior:* Each team member is an ambassador of our team. Solid behavior choices should be demonstrated at all times, in and out of school activities.
2. *Ability to Commit to a Project:* Your word is very important. Don't take on a task you can't perform. If you are having problems with a project, ask for help. There is no excuse for a broken promise.
3. *Ability to Work Independently and as a Team Member:* Working independently, with little or no direction, shows dedication and willingness to learn. Being a team player and supporting team decisions is just as important.
4. *Demonstration of Honesty and Integrity:* Honesty and integrity are highly valued attributes. Team members must demonstrate their trustworthiness.
5. *Time to Spend on Activities:* This team requires many hours of a student's free time. Careful planning and scheduling may be required to stay actively involved. In some cases, choices as to other activities may need to be made.

## EXECUTIVE LEADERSHIP TEAM SELECTION

### *LEADERSHIP POSITIONS*

A President will be selected and Vice Presidents will be selected for the following five categories: Fabrication, Programming, Finance, Marketing, and Logistics.

*ELIGIBILITY*

To be eligible participate as a member of the executive leadership team, a student must have a minimum 3.2 GPA and be able to attend after school meetings on Mondays and, Wednesdays from 3:15-5:15 p.m. and on

*APPLICATION*

Students must submit an application, cover letter, and resume, to be considered for a leadership position.

*INTERVIEW*

Students will be interviewed by faculty members and the lead mentors for placement on the executive leadership team. Applicants will be scheduled for interviews to be held after school hours. Interviews will last approximately 10 minutes. During the interview, each student will be assessed for his/her strengths and talents to ensure appropriate placement on the executive leadership team.

*SELECTION CRITERIA*

Students will be selected for the executive leadership team based on their strengths, talents, experience, and skills. Particular attention will be given to matching a student's strengths with the requirements of the position. Students who are not selected for a vice-president level position are eligible for other team positions, including sub-team managers.

**COMPETITION DRIVE TEAM SELECTION**

*ELIGIBILITY*

To be eligible for participation on the Competition Drive Team, students must be active participants in the after school team program with at least 90% attendance and must not be the subject of any disciplinary action.

*APPLICATION*

Students must submit an application in January for participation on the Competition Drive Team. The application will be reviewed by the executive leadership team. Applicants will be interviewed by the entire executive leadership team. If an applicant is a member of the executive leadership team, that applicant will not participate as an interviewer.

*SELECTION CRITERIA*

The specific selection criteria will be identified by the rules team. In making their selection, the executive leadership team will follow the established guidelines.

## ADULT MENTORS/VOLUNTEERS

### MENTORS

Next to the students, mentors are the most important members of the team. They enable and inspire the students to do more than most people expect of high school students. They teach and guide students in all parts of the designing, building, marketing, and operating the robot. Mentors have a number of important responsibilities, but also reap incredible rewards.

1. Mentors are responsible for inspiring students in science and technology.
2. Mentors are responsible for motivating and engaging students in meaningful activities in the designing, building, marketing, and operating the robot.
3. Mentors are responsible for creating an atmosphere of open communications where students feel free to think independently, voice their opinions, and take risks as long as they do not impose a safety hazard. Mentors are expected to be active listeners and they are expected to make sure that everyone understands what is being said or what is being decided.
4. Mentors are responsible for making sure that students are completing tasks on time. This includes helping to develop a timeline for activities and trusting students to complete tasks while holding them accountable for their assignments.
5. Mentors are responsible for creating an atmosphere of trust and respect. Mentors are expected to show trust and respect to every student while fostering the same trust and respect in themselves.
6. Mentors are responsible for making sure that a safe environment is maintained and safety procedures are being followed, such as wearing safety glasses and using power equipment properly. If there is an unsafe condition, mentors must step in and restore safety to the situation.
7. Mentors are expected to be positive examples to the students. This includes controlling offensive language and modeling good behavior.
8. Mentors must strive to maintain a positive attitude and an optimistic outlook at all times.
9. Mentors are expected to facilitate instruction and have students do as much of the work as possible. They are to coach, teach, and observe students while remaining ready to step in as needed.
10. Mentors are encouraged to read the *FIRST* Mentoring Guide available at the *FIRST* website ([www.usfirst.org](http://www.usfirst.org)) and on Projjex.com.
11. Mentors must remain alert to vulnerable situations that they could be placed in. They are not to transport students in their own vehicles without written parental permission. They are not to be alone with a student in a vehicle or in a hotel room.
12. Mentors must meet the requirements of the SDUHSD background check and fingerprinting process.

## PARENT/GUARDIAN RESPONSIBILITIES

The parents/guardians of our students are an important part of the success of our team and are considered to be team members. Whether they are mentors, part of a support group, or spectators at competitions, they fill a vital role. There are a number of responsibilities that each parent has as a part of their student being on the team:

1. Parents/guardians are responsible for attending all parent meetings.
2. Parents/guardians are responsible for providing transportation to make sure that students are on time for meetings, build times, and events. Timely transportation must also be provided so that students have rides home immediately afterwards.
3. Parents/guardians are responsible for signing and returning permission slips, waiver forms, and other legal documents on a timely basis for their students under the age of eighteen.
4. Parents/guardians are responsible for providing the team Faculty Advisor(s) with accurate medical/emergency information for their student.
5. Parents/guardians are responsible for providing a general contact phone number and a dependable email address for the team to provide them with information about upcoming events and team opportunities. Email is the primary and often the only method of contacting members of the team.
6. Each family is expected to provide at least one dinner during the build season for the mentors and student team members. The food committee will develop the schedule for dinners. These meals can be homemade or purchased.
7. Parents/guardians are responsible for the conduct of their child. If there is a violation of the code while on an out-of-town trip, parents will be responsible for providing transportation, at their cost, to return the student home.
8. Parents/guardians are encouraged to attend events and provide support for the team. These events may be competitions, team gatherings, or public events.
9. 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 should stop in at the build site from time to time to see how things are going.
10. Parents/guardians are encouraged to become team mentors. Becoming a mentor adds additional responsibilities but is a very rewarding experience. Parents/guardians do not have to be engineers to qualify to be mentors.

## OVERSIGHT

The Teacher Advisor of the Robotics Team shall be an employee of Canyon Crest Academy and will provide oversight on behalf of the school. The role of the Teacher Advisor will be to provide guidance and advice to the executive leadership team, and to ensure compliance with all school rules and guidelines. He/she shall have the authority to veto decisions of the executive leadership team in the best interest of the school.

## COMMUNICATIONS

## TEAM EMAIL ADDRESSES

Each team member will set up an email account through Google (Gmail) that will be used solely for robotics. The format of the email address will be uniform for the team and will appear as:

"[first initial][last name] 3128@gmail.com"

If your name was Joe Student, your email account would be: jstudent3128@gmail.com.

## EMAIL CONTENT

This email address should be used for robotics business only. No personal emails should be sent using this address. The content of all emails sent via the robotics email must be appropriate for the school setting and must be in conformance with the technology guidelines set forth in the Canyon Crest Academy Student Handbook. During the build season, team members should check their email every day, especially after 9pm for information from the executive leadership team and team mentors.

## CELL PHONES

Cell phones may not be used during the team meetings or while in the shop area. No exceptions. Cell phones may be used, with permission, during the after-school production team meetings for team purposes, to contact parents, or to secure rides, as long as the calls are not made from within the shop area. Students may also use cell phones while at events, except when working on the robot.

## EXPECTATIONS

### PARTICIPATION

Students can participate at many levels. Students on the executive leadership team will make the greatest investment of time. They will be expected to attend all executive team meetings, regular team meetings, team activities, and competition events. Students on the management team will be expected to attend all management team meetings, regular team meetings, team activities, and competition events. Ancillary team members will work with the leadership and management teams to provide assistance in specific areas, as needed by the team. They may work on their own time or in conjunction with the production team to provide services and products to the team.

### BEHAVIOR

A team member's behavior is under scrutiny at all times. It is very important that students understand that they represent Canyon Crest Academy, San Dieguito Union High School District, the Canyon Crest Academy Robotics Team, the City and County of San Diego, and our corporate sponsors.

### SCHOOL

The behavior of team members in school, and specifically in the classroom, is a message to all regarding the caliber of students on our team. You are looked upon as role models and examples of the best students our school has to offer. You are expected to be polite and respectful to all staff members and refrain from activities that are considered disruptive. Any team member receiving disciplinary action of any type is subject to review by the advisor. If you think you shouldn't do it, don't do it.

### *EVENTS*

All eyes are on you every minute you are in public. Your behavior is a direct reflection on your character and on our team. A judge or member of another team may overhear what you say to one another and how you say it. We are a very close family when we travel and conflicts may arise as a result. Students should refrain from rumors, he-said-she-said, and negative comments about one another. If a problem arises with another student, you are requested to speak to a chaperone or mentor immediately. Students are not allowed to have physical conflicts with each other. If a problem such as this arises, both students will be disciplined as per school rules. If this occurs at a competition, you will be sent home at your expense. We will not tolerate any disrespect or disruptive behavior.

### *COOPERATION*

Students are expected to cooperate at all times. This means that, if a chaperone or mentor requests you to do something, you will comply to the best of your ability. If you feel a request is out of order, you are encouraged to complete the task then speak to the team's teacher advisor at a more appropriate time. Disrespect towards any chaperone or mentor will not be tolerated and you will be disciplined and possibly removed from the team.

### *INAPPROPRIATE BEHAVIORS*

Inappropriate behaviors include but are not limited to the following:

- Running in hallways
- Pushing and shoving
- Name calling
- Making messes/breaking things
- Fighting
- Swearing
- Stealing
- All other activities that reflect negatively on the team

### *BOYFRIEND/GIRLFRIEND*

In the event that a relationship develops or is ongoing, there are certain guidelines that must be adhered to at all times when engaged in team activities, local and away. ***Hand-holding, hugging, kissing, and other expressions of affection are prohibited at all times. The couple must travel in a group at all times. Couples may not wander off or sit alone. In other words, they should not appear as a couple but as part of the team. Common sense should prevail at all times.***

## VIOLATIONS

The chaperones and mentors reserve the right to discipline a team member as necessary for the safety and overall good of the team. Parents will be informed of any disciplinary actions as soon as possible. The disciplinary process shall be as follows:

- Step 1 The student will be advised by a chaperone or mentor as to the unacceptable actions and asked to make appropriate changes to remedy the situation.
- Step 2 The student's parents will be contacted to discuss the situation.
- Step 3 The student will be suspended from the team for the next 2 team functions/events or a period of 2 weeks, whichever is longer. During this time they may not participate in team meetings, team competitions, or any other team activities.
- Step 4 The student will be removed from the team.

In the case of safety violations, the rules in the safety section shall apply.

## STUDENT MENTORS

Students are encouraged to work as mentors to the *FIRST* LEGO League (FLL) and *FIRST* Tech Challenge (FTC) teams at Carmel Valley Middle School and Earl Warren Middle School. Their interaction with younger students will help to build a strong robotics program at those schools that can feed into the robotics program at Canyon Crest Academy in future years.

## ENGINEERING NOTEBOOKS

Students on the design and fabrication teams will maintain engineering notebooks. The engineering notebooks may be maintained by a single team member or they may contain the contributions of several team members, but the entries need to highlight the thoughts of all team members and mentors.

Engineering notebooks are not the team's scrapbook and should not be decorated. The notebooks should be simple but informative and should document brainstorming ideas, trial designs, and team strategies. A season summary should be included at the end of the last notebook.

Sample entries would include:

- What the team experienced during the engineering design process
- Drawings and descriptions of the robot during the different stages of design
- Experiences of teamwork and communication during the building of the robot
- Interesting moments, obstacles, and 'A-ha!' revelations
- Lessons learned from the entire experience

Engineering Notebooks do not need to, and should not, appear perfect. They should reflect the team's personality and spirit and reflect an ongoing work in progress. Spelling mistakes, scratches, abandoned pages, or other blemishes should not be of concern. The notebook should reflect the last-minute designs, quick thoughts while designing, or brief notes that may remind the team for an idea later on.

## TEAM PROCESSES/ACTIVITIES

### DESIGN PROCESS

The design process provides general direction for engineers when they set out to solve problems. By working through these steps sequentially, they increase the odds that their concepts will work when built. Iteration is an important part of the design process. Iteration is the repetition of steps within the process, leading to a final product. The design process is not really a cycle of repetition, but a spiral of iteration with each part of the process building on previous iterations. Failure (and the lessons we learn from it) is a necessary part of the process.

The design process consists of the following parts:

- Identify the challenge
- Research and brainstorm ideas
- Evaluate ideas for feasibility
- Prepare a preliminary design
- Build and test a prototype
- Analyze and evaluate the preliminary design
- Redesign and retest as necessary

### *IDENTIFY THE CHALLENGE*

The team must first identify all of the key elements of the challenge and develop specific goals that the design solution must satisfy in order to completely meet the challenge. Once those goals have been established, the team must identify all of the constraints within which the design solution must be accomplished. Those constraints might include budgetary restrictions, restrictions on specific parts and materials, manufacturing resources, size and weight restrictions, time, labor skills, and other concerns.

### *RESEARCH AND BRAINSTORM IDEAS*

Once the design goals and constraints are clearly specified, the design team can turn its attention to researching and brainstorming conceptual solutions. Conceptual ideas may be completely new and innovative, or they may be clever ways of transforming an existing design to meet the current design challenges. During the brainstorming session, it is important to generate an atmosphere which induces creativity and free-thinking. While brainstorming, do not let feasibility concerns get in the way of creativity. Challenges can be broken down into a collection of smaller sub-challenges. Conceptual ideas

can then be generated for each sub-challenge separately. The end result should be a few conceptual designs which may have the potential to satisfy the design goals and constraints.

### *EVALUATE IDEAS FOR FEASIBILITY*

Once a few conceptual designs have been generated, they need to be evaluated against the goals and constraints of the project. At this point, there may be a need to re-define the design goals and constraints. Rough calculations may be needed to establish the feasibility of each conceptual design within the constraints. At the completion of the evaluation process, one refined conceptual design should be identified which has a reasonable chance of success.

### *PREPARE A PRELIMINARY DESIGN*

Once the team has settled on a single conceptual design, the engineering department will prepare detailed drawings and engineering plans and solicit feedback from team members. Each preliminary design is likely to have some good points and some bad points. The team will modify the plans to incorporate the best ideas. The final product should be a set of plans that can be used to build a prototype.

### *BUILD AND TEST A PROTOTYPE*

A prototype is the first full-scale and functional model of the robot. It will be built from the preliminary design. The prototype should be tested and evaluated to determine whether or not it can satisfy the design goals established at the start of the process.

### *ANALYZE AND EVALUATE THE PRELIMINARY DESIGN*

Almost every prototype has unanticipated flaws. If flaws are found in the prototype, the team will need to analyze where, why, and how the failures occurred and research and brainstorm potential cures for the problems.

### *REDESIGN AND RETEST AS NECESSARY*

After evaluating the prototype and brainstorming solutions, the team will need to redesign the robot, fabricate a new prototype and retest. Once all of the bugs have been worked out, the design is ready for final production.

## **PRODUCT AND MATERIALS APPROVAL PROCESS**

All engineering designs, parts, and materials to be used in the robot fabrication process must be approved by both the Fabrication Vice President and the lead mentor. Plans, parts, and materials lists will be submitted first to the Fabrication Vice President and the lead mentor. Parts and materials may not be ordered and fabrication may not begin until the proper approvals have been received.

## **PROCUREMENT PROCESS**

Requests to purchase parts, materials, supplies, or products must be submitted on a requisition form and must include the following information:

- Date of the request
- Name of the person making the request
- Name of the sub-team to which that person belongs
- Name of supplier
- Address of supplier (including zip code)
- Phone number of supplier
- Fax number of supplier
- Quantity
- Manufacturer's item/product number
- Item/product description
- Unit price
- Extended price
- Sales tax
- Shipping cost
- Total cost

Requests must be approved by the sub-team manager and vice president of the department before being submitted to the president/CEO for consideration. All purchases related to the construction of the robot must be approved by the Engineering Vice President and the Quality Control Vice President.

## AWARDS SUBMISSION PROCESS

Awards submissions will be developed by the Reports and Awards sub-team and approved by the Reports and Awards Manager and Marketing Vice President before being submitted to the executive leadership team for review. All submissions will be finalized for review at least one week prior to the submission deadline. The executive leadership team will review the submissions and provide feedback to the Public Relations Vice President. All final changes will be made and awards applications submitted to *FIRST* at least two days before the deadline to avoid last-minute technical problems.

## SCHEDULE AND EVENTS

### SEASON OVERVIEW

There are four distinct seasons within the robotics year:

Pre-Season	August through December
Build Season	January through February
Competition Season	March (possibly April)
Post-Season	April through May

## PRE-SEASON MEETING SCHEDULE (SEPTEMBER – DECEMBER)

During the Pre-Season, the team will organize, train, and prepare for the Build Season. The schedule will be as follows:

- Executive Leadership Team: Mondays and Wednesdays, 3:15pm to 4:30pm  
F-101, Thursdays at lunch 11:30 to 12:00
- Management Team: Mondays and Wednesdays 3:15pm to 4:30pm  
F-101
- General Team: Mondays 3:15pm to 4:30pm

## BUILD SEASON SCHEDULE (JANUARY 9 – FEBRUARY 23)

The Build Season starts January 9, 2010, at 8 a.m., with a meeting at High Tech High in San Diego. At the kick-off event, the new game will be revealed and the team will receive the kit of parts and any new software necessary for the game. The shipping date for the finished robot is February 23, 2010, for all FRC teams around the world. The six weeks in between those two dates is known as the Build Season.

During the Build Season, the schedule will be as follows:

- Executive leadership team: Mondays, 7:30am-8:40am, F101  
Monday-Friday, 3:15pm-5:15pm, F101  
Thursdays, 11:30am-12noon, F101
- Management Team: Monday-Friday 3:15pm-5:15pm, F-101
- General Team: Monday-Friday 3:15pm-5:15pm, F101
- Fabrication Team: Monday-Friday 3:15pm-5:15pm, F101  
Saturdays, 9 am-5 pm  
Sundays and Holidays – as needed to complete the robot.

Additional time may be needed, depending on the number of team members and the complexity of the challenge. This is an extremely stressful time of the year for those building the robot. Students will need to limit their other extracurricular activities during the Build Season (January 3 – February 18). Once the robot is shipped, the team will revert to the normal meeting schedule.

## COMPETITION SEASON (MARCH – APRIL)

The Competition Season consists of Regional Tournaments (during March) and the Championship Tournament (during April). To participate in the Championship Tournament, the team would need to qualify at a Regional Tournament.

### *SAN DIEGO REGIONAL TOURNAMENT (MARCH 4 – MARCH 6)*

Regional Tournaments are scheduled every weekend in March across the United States and in foreign countries. The tournaments are scheduled to run Thursday through Saturday. Two Regional Tournaments will be held in Southern California: One in San Diego and one in Los Angeles. Regional Tournaments will also be held in Las Vegas and Phoenix. The schedule at the Regional Tournaments is as follows:

Thursday: Uncrate the robot, set up the pit, final repairs, robot inspection, practice

Friday: Opening ceremony, seed rounds, evening team activity

Saturday: Finish the seed rounds, final rounds, awards

During the Regional Tournaments, robots will be placed in alliances of three robots each. Two alliances (6 robots) will take the field at a time. Alliances will be randomly assigned during the seed rounds. Each team will participate in approximately 6-7 seed rounds, depending on the number of teams at the event.

For the final rounds, the top 8 teams will select their alliance partners. 24 robots in total (8 alliances) will participate in a double-elimination tournament. The teams on the winning alliance will be eligible to attend the Championship Tournament in April.

Other awards will be given out at the Regional Tournament, based on information submitted in the awards applications and conversations between judges and team members at the competition. The rookie team that wins the Rookie All-Star Award and the veteran team that wins the Chairman's Award will be eligible to attend the Championship Tournament in April.

### *CHAMPIONSHIP TOURNAMENT (APRIL 14 – APRIL 17)*

The Championship Tournament is held in Atlanta, Georgia in April. Approximately 240 teams from around the world participate. The competition is held in the Georgia Dome and the pits are located in the convention center next door. The Championship Tournament runs Thursday through Saturday in much the same manner as the Regional Tournaments. There is typically a major team activity planned for Saturday night.

If the team becomes eligible to attend the Championship Tournament in April, a decision will need to be made, immediately, whether or not to ship the robot to Atlanta. Participating in a Championship Tournament can cost a team about \$25,000.

### *POST-SEASON MEETING SCHEDULE (APRIL – MAY)*

Once the robot has been shipped (in February), the team's meeting schedule will revert to the schedule used during the Pre-Season.

## DEL MAR FAIR

Team San Diego typically sponsors an off-season robotics demonstration tournament at the Del Mar Fair. The demonstration usually takes place on the first Saturday of the fair. The students and parents who participate in the 3-hour event will receive free tickets to the fair for the day. The robot can also be entered into the manufactured items competition.

## TIME COMMITMENT

It is understood that our students are very busy in many other school activities. These activities are encouraged and supported by our team. It is the responsibility of the students to manage and balance all of their activities, informing their teachers and mentors of their commitments. Sports teams, clubs, and robotics will place demands on your time. It is important to communicate with your coaches and mentors to work out the timing of your activities. Often these activities can be accommodated to the satisfaction of all parties.

There are some instances however, where the timing cannot be resolved. In this case the students may have to choose which activity they will be putting their time and effort into. Please discuss this issue with coaches and mentors before making a final decision.

## TRAVEL

Traveling as a team is very exciting and rewarding and is often the highlight of a student's year. A great deal of planning and organization is required to coordinate all of the associated activities. A strong effort is given to make travel an educational/cultural experience. Safety is always the major concern.

### AIRLINES

Traveling on aircraft is fun and exciting for most team members. There are special procedures we must follow to ensure safe and efficient travel. We will wear FULL uniform for travel at all times. Items that are not designated as a part of the team uniform will not be worn. This includes head coverings, scarves, and other non-uniform items.

### LUGGAGE

It is very important to pack efficiently. Bring only the clothes and items that are necessary. Remember, students must carry their own luggage in the airport. Do not bring oversized or overweight bags. You are only allowed one suitcase and one approved team carry-on. All bags must be identified with the student's name and address on a tag prior to entering the airport. Additionally, with growing restrictions on items

that can be taken on a plane, please check the flight websites for packing guidelines. We do not want to be held back for any reason.

### *DEPARTURE FROM SCHOOL*

We will meet at the school at the designated time and location. Please be on time, as we will not wait for students. Have a back up system to your alarm clock and travel to the school. All students will assist in loading the luggage on the bus and unloading at the airport. We must be as quick as possible.

### *AIRPORT ARRIVAL*

At the airport, after unloading the luggage, we will form two lines of students moving to a designated area. Students must stay out of the way of other travelers and to keep talking to a minimum at all times. Once inside, students will stay in the designated area at all times. Luggage is not to be out of our control at any time. If a student needs to use the restroom he or she will need permission of a mentor. When we are ready to process luggage and tickets, students will form a line based upon alphabetical order.

### *COUNTER PROCEDURE*

Students will process their luggage and ticket at the counter. Mentors will go first to assist in the process. Students will be processed in alphabetical order. At the counter students will show the agents their school Identification. It is important to have the identification ready to be shown. You will also be asked several questions regarding your luggage. This is a serious time, so pay close attention and don't make jokes. When completed, move to a designated location while the others are processed.

### *SECURITY CHECK*

When all members have been processed, the team will proceed through the security checkpoints. At this point, all metal items, pocket change, cell phones, belts, shoes, and keys should be placed in a tray at the checkpoint. Form a single line placing the tray and your carry-on item on the conveyer belt, when appropriate. Wait to be directed through the detector by the security person. Collect all items and wait in the designated area. You will need to stay close to the wall and out of the traffic area. Keep talking to a minimum, and wait for directions. When all team members have all gone through the process, we will proceed to the gate. Do not stop at the bathrooms, get a snack, or wander away from the group at this time. Permission will be given later, if time permits.

At the gate, find a seat and stay with our group until you receive further instructions. If time allows, you will be allowed to go to the bathroom or to get a snack. Travel in groups of three or more at all times. If you are leaving your carry-on behind, please ask another student to keep control of your bag. We will take attendance several times in the airport.

### *PLANE ENTRY*

The mentors will issue a boarding pass at the gate. This process will vary depending on the airlines and the workers at the gate. If you are given a boarding pass, do not put it away at this time. Keep it ready for

boarding. Directions will be given for you to board the plane. When entering the aircraft, please go to the assigned seat. Locate an empty spot overhead and store the carry-on or place it under the seat. Once seated, follow all directions as given.

Trading seats is only allowed with a mentor's permission. If you feel ill or need assistance, please get the attention of one of the mentors. Some people have a problem with the changing air pressure in the cabin. Chewing gum and swallowing frequently sometimes helps. Consult your doctor prior to travel if this is a known problem.

### *PLANE EXIT*

After we land, exit the plane in a safe manner. Remember to get the carry-on luggage and other materials before leaving. Be courteous to others as you exit. Upon exiting the plane, the team will gather to the side and out of traffic. Listen and watch for the directions of the mentors. After taking attendance, we will proceed to the baggage area. Walk in double file lines to the side, away from traffic. At the luggage claim, wait and watch for your luggage. Once you have your luggage, go to the designated location and wait for directions. We will follow the same directions as at the school for loading luggage and boarding transportation.

### **BUS**

Luggage will be stored in the lower compartments. Do not open the windows without permission. If you have a snack or drink on the bus, be sure to take the trash off the bus when you exit. When leaving the bus, make a check of the area to ensure that all belongings are accounted for.

### **CAR**

When traveling by car, you will be allowed to select the car in which you ride. You will need to ride in the same car both ways. If you need to make a change, you must get the approval of a mentor. Seatbelts must be worn at all times.

### **HOTELS**

When we travel, we may stay at a hotel for several nights. Students will be organized into room groups of either three or four students, depending on the quantity of students and room availability. Students may be allowed to select roommates of their choice. However, there will be no co-ed rooms. Rooms are either all girls or all boys. Each room will have a mentor or chaperone assigned to monitor activities. This may include room inspections.

When we enter the hotel, students will go to a designated location to wait for keys. At that location, students will need to be very quiet so they do not disturb the other guests. The room captains will be given the room keys to distribute. If keys are not available for each student, each group will need to designate one person to hold the key. Students will proceed to the rooms as soon as key distribution is complete. If your room is not ready, your luggage will be put in another room until your room is ready. Upon entering your room, you should complete the room inspection form and have it ready for the coach. Often there is free time in the hotel to get snacks, play in the game room, or swim. If there is a pool, a mentor or

chaperone must be present to swim or use the hot tub. Appropriate attire is required. Please check with a mentor or chaperone if there is any question.

## UNIFORMS

### AFTER SCHOOL

During the Pre-Season and Post-Season, it is optional to wear the team shirt on Mondays. During the Build Season, all team members will wear their team shirts to school on Mondays, to draw attention to the team's activity.

### TRAVEL DAYS

On travel days, the team will wear a full travel uniform, consisting of a specified shirt and pants combination, as designed by the team each year. The purpose of the uniform is to identify team members easily while in public. Items that are not designated as a part of the team uniform will not be worn. This includes head coverings, scarves, and other non-uniform items.

### COMPETITIONS

On Thursday, team members will wear work uniforms, as designated by the team. On Friday, team members will wear full uniforms. On Saturday, team members will wear a specialty uniform, as designated by the team.

## FINANCES

### CORPORATE SUPPORT

Major funding for the robotics program has been received from several corporations in the San Diego area. It is our hope to receive additional funding this year and in future years from organizations interested in supporting technology-based activities in the school system.

### TEAM BUDGET

The team's budget will be developed each year in the fall semester. It will include all income and expenses anticipated for the year. The budget should be based on realistic expectations of funds to be received and solid estimates of expenditures, based on current prices. The budget will be approved by the executive leadership team, and must be followed when making purchasing decisions. The budget can be amended during the year to shift funds from one category to another, but the team cannot spend money it does not have.

### EXPENSE TRACKING

Income and expenses will be tracked by the Vice President of Finance throughout the year, and reports will be given to the executive leadership team on a monthly basis. A Bill of Materials, recording the expenses directly related to building the robot, will be prepared for presentation to the judges at each tournament.

## FUNDRAISING

### *CORPORATE FUNDRAISING*

Additional funds will be necessary to carry out all of the activities of the team for the year. It is our intention to receive additional funding through corporate sponsorships, not local fundraisers. The executive leadership team will develop a business plan that will be used to seek sponsorships from local corporations and businesses. All sponsors will have their logos included on the robot, the website, the team banner, and team literature.

### *.INDIVIDUAL DONATIONS*

The team will actively seek donations from individual friends and family to help the support the team's activities. Donors are graciously acknowledged on the team's website. Donations are tax deductible to the full extent allowed by law.

## STUDENT COSTS

### *REGIONAL COMPETITION TRAVEL (PARTIAL)*

While we anticipate covering most of the travel expenses through corporate and local fundraisers, it may be necessary for students to provide a portion of the costs to travel to an out-of-town Regional Tournament. Such costs may include partial transportation, hotel, and/or food expenses.

### *APPAREL COST*

Team members will pay for their own uniforms and team shirts, unless sufficient money is raised through team sponsorships to offset the costs.

### *MEALS*

All meals are the responsibility of the individual team members.

### *INVITATIONAL COMPETITION EXPENSES*

If the team should become eligible to attend the Championship Tournament, a large amount of money will be needed in a short amount of time. The typical cost of sending 20 team members to Atlanta, along with mentors and chaperones, is approximately \$25,000. The team could have as little as two weeks to raise the money. Parents and team members will need to decide, ahead of time, how they will cover that expense.

# MACHINE SHOP

In anticipation of having a robotics lab and machine shop located at the high school beginning in the 2010-2011 school year, the following rules and guidelines will apply.

## SAFETY

Everyone is responsible for safety during team meetings and during the design, build, travel, and event phases of the competition. Basic safety guidelines are included in this manual. For a full understanding of safety procedures, please read the entire *FIRST* Safety Manual.

## *RELEASE FORMS*

No one will be allowed to work in the shop without providing a release form signed by themselves, if eighteen or older, or by a parent/guardian, if under the age of eighteen.

## *TRAINING*

General safety training, as well as training on specific tools and machinery, will be provided during the Pre-Season. All students intending to use hand tools, power tools, or machinery must be trained on how to operate the specific tools or machines safely. All training will be documented.

## *SAFETY TESTS*

Prior to working in the shop area, all students must pass a basic shop safety test. In addition to the basic shop safety test, students will be tested on the safe use of specific tools and machines. Students must answer at least 90% of the questions correctly to be approved for operation of the specified tool or machine.

## *BADGES*

Students will be issued shop badges specifying the categories of equipment they are cleared to use. A basic shop badge (orange) will allow a student to enter the shop and use hand tools. A proficient shop badge (yellow) will allow a student to enter the shop and use hand tools and hand-held power tools. An advanced shop badge (green) will allow a student to enter the shop, use hand tools and hand-held power tools, and use specified machines, as approved. Visitors will receive a visitor's badge (white, with a large "V") after signing in. Shop badges must be worn at all times while in the shop. Failure to wear a badge will result in removal from the shop. Badges will be stored in the Team Room.

## *SAFETY GLASSES*

ANSI-approved safety glasses will be worn at all times while in the shop or while working with parts or tools in the Team Room. Safety glasses will be worn in the pit areas at all tournaments and when packing and unpacking the robot. The drive team will wear safety glasses at all times while handling the robot and while on the field. Anyone who is not wearing safety glasses in these places will be asked to leave the

area. If you wear prescription glasses, and they are not ANSI-approved safety glasses, you must wear approved safety goggles over them to achieve adequate protection.

### *FOOT PROTECTION*

All people entering the shop must wear shoes that completely cover the entire foot. Shoes must have closed toes and heels to protect against foot injuries. Flip-Flops, Sandals, Mules, Crocs, etc., are not acceptable when working in the shop, on or near the robot, or while attending *FIRST* competitions.

### *HORSEPLAY*

Horseplay, video games, computer games, and music are not allowed in the shop or Team Room. If work for the day is complete, make sure your ride is coming and work on homework.

### *SAFE WORKING SPACE*

A safe working space must be maintained around you at all times. Make sure that the area where you are working is large enough to handle the tools and materials you are using. If you are handling long pieces of metal, make sure the space is clear for the entire length of the material. Do not swing parts around without looking first.

### *HAIR AND CLOTHING*

No loose hair or loose clothing is permitted around power tools or machinery. Spinning objects can catch loose hair or clothing and pull you into the tool or machine. If you have long hair, please tie it back or put it under a hat. Do not wear open sweatshirts or clothing with baggy sleeves.

### INJURIES

**Check** –Check the scene.

- Is it safe?
- What happened?
- Who is injured?
- Is someone there who can help you?

**Call** –Find a supervisor. Call an emergency number. If an emergency occurs, the operator will need to know:

- Your name
- Street Address
- Telephone Number
- Location
- Description of Emergency

*Care* –After contacting emergency care professionals, use the first aid tips and kit to care for the victim. Remember, the best thing you can do for someone who is severely injured is to help get an emergency care professional as fast as possible.

### *REPORTING REQUIREMENT*

Regardless of severity, report all accidents, injuries, and near misses to your team’s mentor and your team’s Safety Manager. Even injuries that you determine as minor may become serious if proper medical attention is not provided in a timely manner. Remember, each minor event can be a precursor to a major event.

### *GENERAL SHOP RULES*

The following general rules shall be observed at all times while in the shop:

- No student shall work in the shop without an adult supervisor on site.
- No student shall work with tools for which he/she is not authorized.
- Badges must be worn at all times while in the shop.
- Safety glasses must be worn at all times while in the shop.
- Closed-toed shoes and long pants must be worn at all times while in the shop.
- Long hair must be pulled back in a holder at all times while in the shop.
- All unsafe conditions must be reported to the shop supervisor.
- All debris/clutter shall be cleared from the floor immediately.
- All work shall cease 15 minutes prior to closing, for shop clean-up.

### *SHOP EQUIPMENT/TOOLS*

#### *TOOL CHECK-OUT/CHECK-IN*

All tools will be stored in the tool crib when the shop is not in operation. During each shop session, one student will be in charge of the tool crib. That student alone will be allowed behind the counter to access the tools. To check out tools, students must sign a check-out sheet. The student who checks out the tool will be responsible for returning the tool to the tool crib at the end of the shop session. At the end of the shop session all tools must be accounted for and stored neatly in their appropriate location.

#### *SAFE EQUIPMENT*

All equipment must be in proper working condition and must have all safety features and guards in place. If a power tool malfunctions (sparks from a motor, a short, etc.), that tool must be locked out and tagged with both the description of the problem and the name of the supervisor tagging the tool. Only a supervisor is allowed to lock or unlock a tool.

#### *POWER TOOLS*

The following rules apply to all power tools:

- Electrical tools must be equipped with a three-wire (grounded) power cable and a three-pronged (grounded) plug.
- Electrical tools may never be powered by daisy chaining cords.
- Attachments used with electrically powered hand tools must conform to the rating and RPMs of the tool.
- Operating limits of the tools must not be exceeded.
- Electrically powered tools must not be used if arcing is noted.
- Electrically powered tools must not be used in areas where there are combustible gases or vapors.
- Cords of electrically powered tools must be safeguarded against crushing, pinching, cutting, and crimping. Any break in the insulation is cause for replacing the cord. Patching or taping the cord is not permitted.
- Never move power tools by pulling on the cord.
- Safety devices must be maintained and used on all powered tools; for example, the blade guard on a circular saw should be in place and in good condition.
- All power tools must be unplugged at the end of a work session.

## *HAND TOOLS*

No tool shall be used for anything other than the purpose for which it was designed.

### **Hammers**

- Hammerheads must be securely mounted on handles, and hammer faces must be free of cracks or irregularities.
- Hammers must not be used as prying tools.
- Driving nails with a machinist's hammer, soft-faced hammers, or tempered tools, etc. is prohibited.

### **Wrenches and Pliers**

- Jaws of wrenches and pliers must be in good condition.
- Adjustable wrenches must be snugly fitted to the nut before applying pressure.
- Extension handles ("cheater bars") must not be used.

### **Screwdrivers**

- Do not use a screwdriver with a broken or bent blade.
- Do not use screwdrivers as chisels or punches, or for prying.
- When using a screwdriver, place parts on a workbench (not in your hand).
- Use screwdrivers with insulated handles for electrical work.

### **Files**

- Files, other than Swiss files, must be equipped with handles.
- Files must be kept clean.
- Do not use files as punches or chisels, or for prying.

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