

# Period 1 Documentation - Project Plan

## Goals and Tasks for Botball 2017

### **Game Goals and Tasks**

1. Identify which points/objectives on the board we will go for; 1/29/18 - 2/2/18
  - a. As a team, review the challenge and go over how each point would be theoretically scored, ranking each objective by max scorable points and difficulty; 1/31/18
  - b. Based off of the possible point value and difficulty rankings, brainstorm multiple different plan scenarios and choose the plan with the highest points and lowest difficulty ratio; 2/1/18 - 2/2/18
2. Construct the game board; 1/29/18 - 2/3/18
  - a. Look over the PVC Cut document provided on the Team Homebase and take note of any items that we have yet to buy
  - b. Proceed to buy missing items from Home Depot and other various locations and cut pvc that we already own to the right lengths; 1/29/18 - 2/2/18
  - c. Conduct a five hour Saturday meeting in which we build the board; 2/3/18
3. Divide the 20 person team into four sub-teams of approximately five members each; 2/5/18
  - a. Assign members to teams based on their coding, building, and overall level of experience, with each team having roughly an equal balance between the four; 2/5/18
  - b. After having created the sub-teams, determine the objective that each team's robot will be going for (from the ones we had previously selected in our plan), based on the strengths of the members on each team; 2/5/18

### **Robot Building Goals and Tasks**

1. Based on their objectives, come up with designs for all of the robots; 2/5/18 - 2/7/18
  - a. Brainstorm several possible designs that could be used to complete the robot's objective and choose the best one; 2/5/18 - 2/6/18
  - b. Create a basic blueprint for each robot which clearly shows all the mechanical and electrical components of the robot; 2/6/18 - 2/7/18
  - c. Determine which combinations of robots from the sub-teams will result in the best point outcome, both for the double elimination and seeding rounds.
2. Make sure that all of the robot designs are compatible with one another; 2/7/18
  - a. Create a document which lists, in three different sections, the LEGO, metal, and electronics of the robots based off of the blueprint. Make any adjustments to designs for any occurring parts-limit issues; 2/10/18

- b. During the building process of a robot, it is often realized that certain components simply cannot be built exactly as specified in the plan. Update the coordination document and once again make adjustments to designs based on any new parts-limit issues; 2/24/18
3. Construct the seeding and double elimination set of robots:
  - a. Construct a base for each robot capable of holding all major effectors and components; 2/10/18 - 2/17/18
  - b. Construct and independently test all major components of the robots, such as claws, arms, and extending mechanisms, etc.; 2/17/18 - 2/24/18

### ***Programming Goals and Tasks***

1. Code the general path of each robot; 2/17/18
  - a. Have the captains of robots that run together coordinate to come up with and sketch out on paper the paths of their robots as to not collide with one another; 2/12/18
  - b. Before the base has been built, create movement functions that incorporate the `mav()`, `gmprc()`, and `cmprc()` functions and then use them to code the path that was planned out; 2/17/18
2. Code all the effectors of the robot; 2/24/18
  - a. Before the effectors have been built, create code to operate them. Replace any servo, tick, or motor values with variables; 2/12/18
  - b. Once the effectors have been built, adjust the used variables in accordance to the actual position and speed values; 2/24/18
3. Code the camera section of the robot; 2/24/18
  - a. Being that we have very rarely used the camera in the past, have any coders planning to use the camera review the camera functions from the Advanced C Coding Resource guide provided on the Homepage; 2/12/18
  - b. Write up the camera code, which, in this case, is for identifying where each sorting zone is located on the board; 2/24/18

### ***Documentation Goals and Tasks***

1. Write the first-period documentation; 2/13/18
  - a. Go over the plan as a whole team and use that information to write the first period documentation; 2/12/18
  - b. Have several team members check the documentation after it has been written; 2/13/18
  - c. Have our adult mentor review the first period documentation so we can submit it; 2/13/18
2. Complete the second-period documentation; 3/20/18
  - a. Choose the robot on which the second period will be based, and meet with the captain of that robot to learn details on the effectors, sensors, and general overall build of the bot. Additionally, take a sample of code for the code review portion of the documentation; 3/13/18

- b. After writing both the code and the build portion, have our mentor review the second period documentation and then submit it; 3/20/18
3. Complete the third-period documentation; 4/3/18
  - a. Sit down with entire team and go over the lessons we feel we have learned and what we would have done differently if we were to start the season again. Then use this information to complete the lessons learned portion of the documentation; 4/1/18
  - b. Assign a specific time outside of the regular meetings for members to complete the online survey, as to not interfere with work time during the meeting; 4/1/18
4. Prepare the onsite portion of the documentation; 4/4/18
  - a. Create a slideshow that can be used as a visual aid that covers all of the onsite documentation rubric points; 4/4/18
  - b. Practice presenting the onsite documentation with a partner to prevent any unnecessary improvisation when presenting; 4/4/18

### ***Schedule Conflicts***

1. Presidents day; 02/19/18
  - a. Many of our members will be out of town due to the holiday and thus unable to attend that meeting
2. March SAT; 03/10/18
  - a. Almost all of our junior members will be taking the March SAT and will be unable to show up that Saturday
3. Spring Break; 03/24/18 - 04/02/18
  - a. Many members of the team will be travelling and unable to show up to meetings

## **Team Organization**

### ***Team Meeting Times***

- Important days to note:
  - Workshop: January 27th-28th
  - Regionals: April: 7th
- General Meeting days:
  - Mondays: 6-9pm
  - Wednesdays: 6-9pm
  - Saturdays: 10-3pm or 10-5pm
- Specific meeting days:
  - January: 29th, 31st
  - February: 3rd, 5th, 7th, 10th, 12th, 14th, 17th, 21st, 24th, 26th, 28th
  - March: 3rd, 5th, 7th, 10th, 12th, 14th, 17th, 19th, 21st, 24th\*, 26th\*, 28th\*, 31st\*
  - April: 2nd\*, 4th

*\*These days fall on spring break, so the schedule may vary*

### **Division of Labor**

- Our team was divided into four sub-teams with each one building a single robot. Each sub team consists of builders and programmers (with some members classifying as both) and has either one or two co-captains. There is one overall captain that helps manage all four teams. Additionally, we have two members who type up and present the documentation, though all team members review it before it is submitted:
  - Base-Bot Team
    - Captain: Jacob
    - Builders: Jacob, Eitan
    - Coders: Jacob, Elvin
  - Reach-Bot Team
    - Co-Captains: Aine, Dominic G.
    - Builders: Dominic G., Talia, Kiara
    - Coders: Aine, Jasper, Aneesha
  - Solid-Bot Team
    - Co-Captains: Anne-Michelle, Michael
    - Builders: Anne-Michelle, Dominic, Nithin
    - Coders: Michael, Illan
  - DE-Bot Team
    - Captain: Sam
    - Builders: Lennard, Chase, Arush
    - Coders: Sam, Kristina, Christian
  - Documentors
    - Jacob, Kristina
  - Overall Captain
    - Jacob

### **Conflict Resolution**

- As most of our team has been working together for many years, it is rare for us to encounter a major conflict, however, when we do, we have an established method for dealing with it:
  1. If the conflict is based on two alternative ways of building or coding something, quick prototypes of each are made, and the prototype that functions best is the way that the team proceeds
  2. If the individuals engaged in the conflict are on the same team and the prototype solution is not available for whatever reason, the decision on how to proceed is left up to captain of that sub-team's captain(s)
  3. If the individuals engaged in the conflict are on different sub-teams, the sub-teams will attempt to compromise in some fashion:

- a. If the conflict is building-based, particularly if it is a parts-limit issue, the teams will try to determine who needs the part the most or attempt to find some kind of middle-ground, which might involve design changes and improvisation of substitute parts
  - b. If the conflict is coding-based, particularly when involving navigation, the teams will attempt to re-plan the navigational paths and reach a compromise.
4. If any conflict results in a game-plan alteration, such as causing two robots to be unable to run with each other, all four teams will meet up and adapt each team plan accordingly to solve the issue. This may result in an entire robot to have to be rebuilt or be modified to be run with a different partner robot
5. If, for any of the above situations, a consensus cannot be made, the final verdict is left to the overall captain