

Period One - Project Plan

Goals and Tasks for Botball 2022-2023

1) Game Goals and Tasks

- a) Meeting to familiarize the team with the new game board and rules; 12/22/22
 - i) Dedicate a meeting to read the full game review. Make sure new members understand the spirit of Botball and other important rules; 12/22/22
 - ii) Review and look at scoring sheet and pieces to better understand the game; 1/28/23
- b) Devise a strategy for scoring in this year's challenge; 1/7/23
 - i) Dedicate time with the team to review all parts of the board and possible paths along with their points. Brainstorm ideas for efficient ways to move across the board; 1/16/23
 - ii) Examine the difficulty of each strategy based on building and coding the bot. Decide on one main strategy to pursue: 1/20/23
- c) Construct the game board; 1/24/23
 - i) Buy needed PVC and recut old PVC. Make sure all measurements have minimal error so that board is as accurate as possible. Make sure all PVC is tightened and screwed into board securely; 1/31/23
 - ii) Organize game pieces received from KIPR and fully complete board. Properly tape board lines, construct other scoring areas, place blocks and poms in correct places; 2/4/23

2. Robot Building Goals and Tasks

- a) Create prototype designs for both robots; 2/8/23
 - i) Brainstorm several possible designs that could be used to complete the robots' objectives and choose the best ones while ensuring that the robots will not interfere with each other; 2/8/23
 - ii) Create a basic blueprint for each robot which clearly shows all mechanical and electrical components of the robot; 2/13/23
- b) Keep designs simple and sturdy; 2/15/23
 - i) Designs should not be over complicated or contain an excessive amount of parts. It should be easy to make adjustments or repair should a change be necessary; 2/15/23
 - ii) The robots should be able to move smoothly without extraneous motion that may cause consistency problems. Thought should be put into factors like a certain side being too heavy, which may cause balance problems; 2/20/23
 - iii) Should a robot fail to meet either requirement, it will be redesigned; 2/20/23
- c) Construct robots; 2/24/23
 - i) If a robot is built differently from originally planned, there may be conflict with the other robot. Adjust designs for any issues with limited or illegal parts; 2/26/22
 - ii) Finish construction of base of robot and basic components like claws and sensor mounts; 2/28/22

3. Programming Goals and Tasks

- a) Decide on the order of tasks for the robot to achieve; 3/1/23

- i) Working to make sure the robots do not crash into each other, which may entail starting one slightly after the other; 3/8/23
- ii) Deciding the order of task completion to score points in the most effective way possible and coding to match this order; 3/8/23
- b) Produce functions to align line-following with the tasks being completed; 3/11/23
 - i) Use python for simplicity, control, and directness; 3/11/23
 - ii) Test code repeatedly on robots, especially to ensure that while our robots should move quickly, they do not move in such a quick manner that they go off-course; 3/14/23
- c) Finalize initial code for all of the robots' tasks;
 - i) Check to make sure motors and servos are running properly; 3/18/23
 - ii) Check to make sure sensors are functioning consistently, and that both robots complete the same tasks every time with not much variation; 3/22/23

4. Documentation Goals and Tasks

- a) Complete the first-period documentation; 3/1/23
 - i) Go over plan as a whole team to write the first period documentation; 3/15/23
 - ii) Have several team members check and edit the documentation; 3/15/23
 - iii) Have adult mentor review the first period documentation; 3/19/23
- b) Complete the second-period documentation; 3/30/23

- i) Choose a robot to use for the creation of video. Assign one or more team members to the task of making sure that information is recorded throughout the design process. Begin documenting the design and code of the main robot as it is being built; 4/1/23
 - ii) Learn to use GitHub by reading given documents and start applying it to code; 4/5/23
 - iii) Have members and mentor review for submission; 4/7/23
- c) Complete the third-period documentation; 4/7/23
- i) Sit down with the entire team and go over the lessons learned and what members would have done differently given a new start. Use this information to complete the lessons learned portion of the documentation; 4/12/23
 - ii) 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; 4/12/23

5. Schedule Conflicts

- a) Studying for AP exams as the tournament approaches
- b) Holidays like President's Day and Christmas
- c) School Work and Midterms

Team Organization

1. Schedule of Meeting Times

a) Important dates:

i) Events:

Workshop, February 11-12, at Great Mills High School in Southern Maryland

(We decided to stay in Rockville and work on the robots.)

Regional Tournament, April 29, at Great Mills High School in Southern Maryland

Global Conference on Educational Robotics (GCER), July 16-21 in St Augustine FL

ii) Period 1 Documents Due March 19, 2023

Period 2 Documents Due April 2, 2023

Period 3 Documents Due April 16, 2023

iii) General Meeting days:

Wednesdays: 7-9PM

Saturdays: 10AM-1PM, ending time flexible depending on needs.

b) Division of Labor

i) Adult Mentor: Bob Ekman

Although there are two robots, the team will collaborate on both, so there is no need to split the builders and coders into separate teams.

- Captain: Dami and Junwoo
- Builders: Ryan, Aiden, Abigail, Jacob
- Coders: Matthew, Jason, Aubrey, Mason, Evie
- Documentation: Ryan, Abigail, Aliya

2. Conflict Resolution

- a) If there is a conflict, it will be resolved as follows:
 - i) If the conflict is based on two alternative ways of building or coding something, quick prototypes of each are made, and the team agrees on whichever one works better.
 - ii) If a quick solution cannot be made, the team will take a vote to choose one side. Each side should give good reasoning for why they believe their idea is better.
 - iii) Should a resolution fail to be made, the team captain has the final say.