

How to Do Documentation

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Documentation is essential to a team's success. As 1/3 of the final score, documentation can literally make or break a team. A good documentation score requires a few tips and lots of typing, but it can be done quite easily. This will detail every part of the documenting process, showing how to do each step well. The information may be obsolete in the coming years since the documentation process may change, but this might still be useful.

Documentation, if you don't already know, is when a team documents its progress and records what it's designing. Every year each team is given a set of guidelines that details what it has to do. Certain objectives have to be completed by certain days. Most teams have trouble with documentation, but documentation is very simple. All a person has to do is read what the guidelines say, use "English" (so that the judges can read it), and title everything, you'll get a one hundred. There are no gimmicks, no shortcuts to get a perfect score, but if the rubric is followed, a perfect score is achievable. Do exactly as the rubric says and you will be fine.

Period 1:

Upload Design Concepts:

In this section, the judges ask for what designs have been made, how they were made, if they have been approved or not by the team, and what the robots will do. Basically, it's a "documentation" (never heard that before) of what the robots will do. All that has to be detailed are the points that will be attempted, the designs that are implemented to accomplish this, and the difficult parts of the design. Do this for three designs, two that are in use and one that is a rejected design.

Upload a Project Plan Document:

This section of Period 1 main subject is to document the schedule of the whole process. There are three parts to this, each of which should be detailed separately. The first part, **Major Goals**, is just that, Major Goals. These goals include game goals, building goals, programming goals, documentation goals, and major events that will affect practices. Each of these subsets of the

Major Goals requires at least three clearly identified goals out of each one, and each of these goals requires a target deadline.

This section should be titled **Tasks to Accomplish Goals**. Basically, this section is about how a person will accomplish their goals. There needs to be a minimum of 2 tasks per subset of the Major Goals. Each of these tasks also needs a deadline.

The last one should be titled **Team Organization**. This should include a schedule of meeting days, up to the tournament. This should also include what jobs each person on the team will be taking, and how the team will handle conflict resolutions.

Upload a Software Design Document:

This part of the documentation process is about what the program will do. This has to start with an introduction, which details which robot this program is for and what the program will accomplish. Following this will be **Program Objectives**. In this, the objectives of the program should be detailed. Each of these objectives should be listed by priority. Also in this should be the behaviors, tasks and features required to complete at least three objectives. Next is the **Testing Plan**. In this section, tests have to be tested to make sure that the three objectives are achievable. Statistics and how the tests were done also have to be included.

Period 2:

Upload Mechanical Systems Design:

This section of documentation details the structure of the two robots. First up is the **Drivetrain**, which is basically the thing that holds the wheel motors, section. All that is needed for this section is a picture of it, a description of the drivetrain, a comparison between another drivetrain, and reasons for a team to use this design. Next is the **Effector**, which is one of the special additions to complete the objectives, section. What is needed here is the exact same as the drivetrain, except for that the descriptions and picture are for the effector. Last is the **Sensor Mount**, which is literally the mount that any sensor is on. This, again, has the same criteria as the drivetrain and the effector.

Next are the Experimental Data and **Data Evaluation** sections. This section is devoted to collecting data from one of the aforementioned structures and then explaining how this will impact any changes. The first part, the **Data**, is a graph with at least 10 points on it. The graph has to be labeled and explained as to how the data was taken. Data Evaluation has to include how the data relates to the tested part, what conclusions can be drawn and how the design will change based on the data.

The last part is the Modified System section. In this part, literally all that is needed is a picture for a modified part and text is for what the change is and why it was done. If you have no change, you can make one up.

Upload a Project Plan Document:

This is the project plan in the first period rewritten into an up-to-date Excel document. On the Excel document, there will be a new spot for the team member in charge of each goal and how far the objective has progressed. The Excel document should be color-coded with such things as the deadline, completion, rejected, in progress, behind schedule, not yet started and non-meeting days. The end product should be a calendar of all the goals in the Project Plan portion of Period 1.

Upload Code Review Document:

This document is exactly what the title states, a code review. This should be conducted by a team member that did not write this piece of coding. The first part should be the **Introduction**, with a brief explanation of what the code will do, who wrote the code and who reviewed the code. This also should have the date of the review. The next part should be the **Best Practices Checklist**. The checklist should include practices to do, such as including comments in the code that document functions and arguments for functions and return values, making variable names that clearly describe what they will do, the avoidance of making unnamed numeric constants, and not having comments with old code that is no longer in use. This section should also include a discussion of checklist criteria the code does not meet.

The next section is about **Reliability**, which includes how the reliability of the code can be improved. Afterwards should be labeled **Maintainability**, which discusses whether the code is easy to use, with ideas on how the maintainability could be improved. The last of this section should be titled **Effectiveness**, where the effectiveness and if the objectives are done correctly is analyzed. This also talks about how the effectiveness of the code could be improved.

Included in this should be an excerpt from the code that supports at least one of the analyses in the second paragraph. A pseudocode should also be included to show how one of the improvements aforementioned could be carried out.

Period 3:

Upload Lessons Learned:

This section is mainly a review of what happened before the Botball regional. All the sections should be about **Experience Gained**, the **Documentation Process**, **Surprises**, and **Advice for Future Teams**. At least a paragraph should be devoted to each of the categories that talks about the said topic. This is just to look back on the past few months and to see what could have gone better or worse.

Complete the Survey:

The very last part should be a survey which every single person on the team should complete. This survey includes many questions about the Botball experience. At the beginning, your team name and number of members in the team will be asked, along with a few things about yourself, such as your role and any other engineering interests. Then, it will ask for any ideas and preferences you have. Such things as possible game ideas and what should be changed are such topics. It is literally impossible to not get a hundred as long as the survey is actually completed.

That's it! The documentation process of Botball is not very hard, as long as all the directions are followed. Remember, documentation is not hard, as long as every single direction is followed, as that is what every single point is defined by. With a great documentation score, any team would be able to do very well in the Botball Competition.