**ENR 161 Spring 2020**

**Design Project Final Written Report**

**Due Date:** At the **start** of your ENR161 Final Exam Period. **Late reports will be** **severely penalized**!

**Required Elements:**

1. **Title Page**:

a. Team name

b. Team Logo (Optional)

c. Team Member Names

d. Date of Submission

2. **Executive Summary that addresses the following items:**

a. Explain the problem that your team solved and the technical challenges that it presented.

b. Write a brief explanation of how your team solved the problem and why it was an optimal solution.

c. Describe how your robot performed in the final class competition and how it compared with others.

3. **Table of Contents that includes:**

a. A list of all sections contained in the report

b. The name of the person who wrote each section

c. The page number that each section begins on (each page in your report must be numbered)

4. **Flow Chart**

Include a flow chart that is an identical logical match for your entire robot’s code. If someone were to use this flow chart to write their own code on the same robot, it should perform exactly as yours does.

5. **Software Description**

Include a flowchart breakdown for each of the following system elements.

Explain the theory behind your algorithm, how did you come up with the ideas for the following:

* Calibration
* PID
* Line counting
* Making turns
* Navigation - How do you program the series of events into your robot?

6. **Robot Competition Description and Results**

a. Describe the goal in the robot competition and explain the scoring

b. Create a table showing the points earned by each ENR161 team in your lecture section during the in-class robot competition. Highlight your team’s results and use a format similar to that shown below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Team Name** | **Overall Score** | **Trial 1 Points** | **Trial 2 Points** | **Trial 3 Points** | **Trial 4 Points** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

7. **Project Assessment**

Assess each item listed below as specifically as you can. Avoid generalized statements that provide the reader with generic clichés that add little information. (e.g. We could have done better with more time. We could improve our robot by making it more reliable. There was too much human error.)

a. Performance

i. Compare your robot’s performance with those of other teams.

ii. Describe features from other robots that you would consider using if you were to repeat this project.

iii. Discuss the features that your robot possessed that other teams may wish to borrow from you design.

b. Team Dynamics

i.Were all members willing and allowed to fully participate in the design and testing?

ii. What would have helped your team work more effectively together?

8. **Writing Quality**

a. Your report must be free of spelling errors. Be careful with spell checking software with auto-correct as misspelled words may end up being changed to words that you did not intend.

b. The writing must be formal. Don’t write using slang or other informal ways in which you may speak.

c. Your grammar must be flawless. Each team member must proof-read the entire report. It is also highly recommended to have someone outside your team proof-read your report.

**ENR 161 Spring 2020**

**Design Project Final Written Report Grading**

**Names \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Grade \_\_\_\_\_\_\_\_\_\_\_\_**

**Required Elements:**

1. **Title Page** **Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Team name, Logo or Image, Names, Date)

2. **Executive Summary Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Problem Definition, Solution, Performance)

3. **Table of Contents Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Sections listed, Author of each section, Page numbers)

4. **Flow chart**  **Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Program flow chart)

5. **Software Description Max Pts (30) \_\_\_\_\_\_\_\_\_\_\_\_**

(PID, Line counting, making turns, etc)

6. **Robot Competition Description and Results** **Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Scoring system, Table of Results)

7. **Project Assessment** **Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Performance and Team Dynamics)

8. **Writing Quality Max Pts (10) \_\_\_\_\_\_\_\_\_\_\_\_**

(Spelling, Formal Writing, Grammar)