**School of Electrical and Electronic Engineering**



Embedded Systems Project

DESIGN REPORT #1

Title: ?

Group Number: 22

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| Group members name: | ID Number | I confirm that this is the group’s own work. |
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Tutor: Click here to enter text.

Date: Click here to enter a date.

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# Introduction

* See the chapter on Reports (near the start of the ESP Procedures Handbook).
* See the specific marking scheme for this section of the report.

You may want to reference books and papers that you have researched. Give their reference like this [1] (see the References section at the end of this document).

# Motor characterisation

In order to design an effective drivetrain for the buggy and algorithm to control the movement, we need to find out the characteristics of the motor that we will be using. These series of experiments are designed to help us find the resistance of the motor, speed under load and torque outputted. The selected motor is a brushed permanent magnet motor, typically around 70% efficiency [1]. Due to low efficiency, this motor would be prone to generate thermal energy, causing its resistance to increase, lowering the effective output of torque and speed. The following tests are designed to identify these thresholds and aid the decision of picking. Using the results obtained in the stress tests, we can compare the values to the load measurements sections to reach an agreement on a gear ratio that would be the most effective to our design.

# Load measurements

* See the chapter on Reports (near the start of the ESP Procedures Handbook).
* See the specific marking scheme for this section of the report.

# Gear ratio selection

* See the chapter on Reports (near the start of the ESP Procedures Handbook).
* See the specific marking scheme for this section of the report.

# Summary

* Design recommendations
* Summary of key results and assumptions.

# References

## Estimated Force to drive buggy up the slope and across flat:

Estimated Forces: flat

Equation 1: [1]

On the flat, assuming air resistance is negligible, the only frictional force is the surface the buggy is on given by figure 1.

1. See the section on Citations and Referencing Styles in the ESP Procedures Handbook.

Make sure that you have **read the top** of the marking scheme to look for report length etc.

Make sure that you have **read the bottom** of the marking scheme for Presentation and Penalties.

Remember to update your table of contents before submitting the report.

Aim to submit the report long before the deadline, to mitigate last minute problems with the internet and with Blackboard.