**1.Introduction**

This document highlights the functional requirements of the matlab DC motors that are with or without PID control and simulate a DC motor that has optimum design focus

**2.Scope**

Software being used to develop my code is MATLAB R2020. The goal of this project is to be able to have a code that can simulate DC motors that are with or without PID control and simulate a DC motor that has optimum design focus

**3.Overview**What will be developed is a code that can simulate DC motors that are with or without PID control and simulate a DC motor that has optimum design focus

**4.Function requirements**

**MotorA1- Open Loop Motor**motor to have the specified step response that has a settle time of 0.13 seconds.

**MotorA2 Closed Loop Motor**Closed loop motor to have step responses with settle times in the specified range of 0.106-0.264 seconds.

**MotorA3 Closed Loop Motor  
The Response of the PID‐controlled motor to noise requirement:** The closed‐loop performance objective is to minimise the motor’s overshoot, the PID design focus should be used is balanced as its the optimum controller design focus to minimise the motor’s overshoot.

**5.External Interface requirements**The required software and hardware for the test environment.

Software required: MATLAB R2020a

## Operating Systems for Mac:

* macOS Catalina (10.15)
* macOS Mojave (10.14)
* macOS High Sierra (10.13.6)

**Hardware required:**

**Processors:**

**Minimum**: Any Intel x86-64 processor

**Recommended**: Any Intel x86-64 processor with four logical cores and AVX2 instruction set support

**Disk: Minimum:**3 GB of HDD space for MATLAB only, 5-8 GB for a typical installation

**RAM: Minimum**: 4 GB **Recommended**: 8 GB

**Testing tools:**

The testing tools that will be used will be Matlab testing framework