

# MIE438 – Microprocessors and Embedded Microcontrollers

Laboratory Experiment 9

## Deliverable

Spring 2018

Department of Mechanical and Industrial Engineering

University of Toronto

Notes:

Practical Section:

Last Name, First Name	Student Number

1. What effect does changing PWMSCLA have on the motor operation? What happens at high values / zero for PWMSCLA, and why?

2. What effects did increasing KP have on the operation of the motor? Is this as expected from what you learned in control theory last term?

3. You likely noticed irregularities, such as periodic jumps or jerks in the motor movement, aside from those you requested by changing the desired position. Speculate on the source **in code** of these irregularities.

4. Describe the effect of adding integral control on the motor's position tracking. What positive and negative effects has it had? Speculate on what causes the negative effects – are they control-related, code-related, or both?

5. Describe the effect of adding derivative control on the motor's position tracking. What positive and negative effects has it had? Speculate on what causes the negative effects – are they control-related, code-related, or both?