

## AME30358 – Score Sheet

M5 – Pendulum with an Active Damper

Name(s): \_\_\_\_\_

For more details on any of the items below, please refer to the lab handout.

The following items will be *demonstrated* to the lab instructor during the allotted lab time. Credit will not be given for portions completed outside of lab.

Item and Description	Points Awarded	Possible Points
<b>Subsystem A: Angle Encoder</b> The time (sec.) and measured angle (deg.) are correctly printed in the serial monitor.		5
<b>Subsystem B: DC Motor Control</b> The motor turns one direction for 4 seconds, then stops and turns the other direction for 4 seconds.		5
<b>Subsystem C: Mechanical Assembly</b> The pendulum is assembled correctly with the motor, reaction wheel, and counter-weight. It oscillates smoothly.		4
<b>Subsystem D: Data Collection and Processing</b> The time traces of measured angle $\theta$ (deg.) and angular speed $\omega$ (deg/sec) look correct.		4
<b>Design Challenge 1 – Proportional Feedback</b> The reaction wheel turns in a way that dampens the oscillations using just proportional feedback.		6
<b>Design Challenge 2 – Proportional-Derivative Feedback</b> The reaction wheel turns in a way that dampens the oscillations. The code and gain values $k_p$ and $k_d$ look reasonable.		4
<b>Clean-up</b> The students returned the lab bench to its initial state.		2
<b>TOTAL</b>		30