Lab 5 Accelerometer Report

Group names: _____ _____ _____

The following list is the material that would logically be included in the **brief** report. It is not intended as a direct guide. You have done the experiments, so you have the best idea of what you needed to complete those projects and what you learned during the process. This means that the following information may be incomplete based on your experience with the project. If you feel part of what you did during the laboratory is pertinent, include that information.

(suggested # of pages, but you may go higher)

Introduction	(<1pg)	**10**	
Purpose/Objectives	_____	_____	
Overview of accelerometer feedback control	_____	_____	*Sum:* _____
Pseudo-code	(?pp)	**15**	
Layout/Format/Clarity/Logic Accuracy	_____	_____	
Indents, alignment	_____	_____	*Sum:* _____
Results, Analysis & Conclusions	(3-4pg)	**35**	
Description of Goal Achieved	_____	_____	
Verification (how was performance to specifications tested	_____	_____	
Analysis of plots from tabulated terminal data w/ explanations	_____	_____	
What was Learned	_____	_____	
Problems Encountered & Solution	_____	_____	
Suggested improvements to HW & SW	_____	_____	*Sum:* _____
Performance Plots	(?pg)	**30**	
Logical layout of data	_____	_____	
Labeled axes with units	_____	_____	
Presentation of plots	_____	_____	*Sum:* _____
Code			
NOTE: no code listing is requested here			
Upload your .c file to LMS under **Assignments > Lab 5**			
Formatting & Neatness	**(?pg)**	**10**	
Cover Sheet (names, section # & side, grading TA)	_____	_____	
Spelling & Grammar	_____	_____	
Required: Academic Integrity and Division of Labor page - **signed** (See the provided template form)	_____	_____	*Sum:* _____
Lateness (unexcused)			
-20% per School Day	-20% x _____	_____	*Sum:* _____
Total		**100**	***Total Points:*** _____

NOTE: No report grades will be given without uploading softcopies of their .c file to LMS for archival purposes in addition to the signed hardcopy. Use last initial of members in the file name (ex. 2B_HHO_lab5.c for a team in section 2, side B with last names Hamlet, Othello, and Shakespeare). Only one team member should upload the file but it must contain all 3 member's name in the header comments.

LITEC Accelerometer Report Guidelines (revised, fall 2015)

The Lab 5 report for LITEC documents the plotted data obtained from the car on the ramp. This rubric (GradingAccelRpt-student) on LMS in the Laboratories & Worksheets section under Course Materials, lists most of the items to be included, but the list is not necessarily exhaustive. Most of the written portion deals with describing and analyzing the plots.

The report should include detailed descriptions of the final goal: the feedback system on the car involving the accelerometer & driving the car to the top (or bottom) of the hill. Discussions should explain how the PWM pulse-width calculations are made based on the errors and feedback gains (proportional, derivative, and integral, if appropriate). With respect to response plots (described below), analyze the various plots and justify their characterstics for the sets of gains used.

2016 Fall: Although for check-off you must demonstrate that the car reaches and stops at the top when started in either corner (left or right), only 2 response plots are required for the report. One should be a good response with "optimal" gains that starts on the left side, turns left to go up the ramp, and stops at the top. The other plot may be anything, including runs that stall on the slope, overshoot the top, oscillate back and forth at the top without coming to a complete stop, or anything else. Be sure to annotate each plot to indicate key points.

Reports must contain:

1) Introduction
2) Analysis of plots from acquired data
3) Pseudo-code
5) Clearly labeled and captioned plots for data acquired during lab, with scaled axes & units
   - Normalized drive motor pulse-width (-100% to +100%) and pitch (front-to-back tilt) from accelerometer, both vs. time as the car drives up the incline.
   - Time plots from the car showing heading angle as it corrects itself for several different values of P gains as the car responds to the accelerometr data. (Follow the cases given in the lab procedure.)
   - {Optional} Any other plots for which you may have acquired data.
6) Do not forget to include a cover page with the team member names, section, side, Grading TA name, and report name. Also you are required to include a division of labor sheet at the end that is signed by all team members.

Academic Integrity Certification *(this part is required exactly as stated)*

All the undersigned hereby acknowledge that all parts of this laboratory exercise and report, other than what was supplied by the course through handouts, code templates and web-based media, have been developed, written, drawn, etc. by the team. The guidelines in the Embedded Control Lab Manual regarding plagiarism and academic integrity have been read, understood, and followed. This applies to all pseudo-code, actual C code, data acquired by the software submitted as part of this report, all plots and tables generated from the data, and any descriptions documenting the work required by the lab procedure. It is understood that any misrepresentations of this policy will result in a failing grade for the course.

Participation *(this is only a template; make changes as appropriate or necessary)*

The following individual members of the team were responsible for (give percentages of involvement)

Hardware implementation: _____
(wiring & pin-out sheet) _____
_____

Software implementation: _____
(pseudo-code & code) _____
_____

Data analysis (if relevant): _____
_____
_____

Report development & editing*: _____
(schematic, diagrams & plots) _____
_____

The following signatures indicate awareness that the above statements are understood and accurate.

_____

_____

_____

*Note, notebook keeping and report development/formatting do not constitute an engineering contribution toward successful laboratory completion.