

# AE483: Lab #2 Rubric

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Your activities in Lab #2 will be assessed with the following rubric.

## **(30%) Attendance (assessed individually)**

You are expected to attend lab during the section for which you enrolled. If you must be absent on a certain day, please speak with your TA or with Prof. Bretl at least one week in advance.

- (10%) You arrived on time and participated actively throughout the first lab session.
- (10%) You arrived on time and participated actively throughout the second lab session.
- (10%) You arrived on time and participated actively throughout the third lab session.

## **(30%) In-Lab Demos (assessed as a group)**

Your group is expected to show all of the following things to your TA during lab. (More detail about each one is provided in the lab manual.) If you do not finish these things during your lab session, you may show them during any TA's office hours until the time at which your report is due.

*From agenda for the first day:*

- (2%) You computed an estimate of  $k_F$ .
- (2%) You justified the way in which you found  $k_F$ .
- (2%) You computed an estimate of  $k_M$ .
- (2%) You justified the way in which you found  $k_M$ .
- (1%) You computed an estimate of  $\ell$ .
- (1%) You computed an estimate of  $m$ .

*From agenda for the second day:*

- (2%) You derived the open-loop EOMs.
- (1%) You derived the closed-loop EOMs.
- (1%) You derived the closed-loop response.
- (2%) You plotted pitch angle and pitch angular velocity as a function of time from hardware experiments.

- (2%) You computed an estimate of  $J_2$ .
- (2%) You justified the way in which you found  $J_2$ .

*From agenda for the third day:*

- (5%) You showed your TA a plot of the state as a function of time for the results in simulation.
- (5%) You showed your TA a plot of the state as a function of time for the results in experiment.

**(40%) Report (assessed as a group)**

Your group is expected to submit a report no later than 11:59PM on Friday, October 20. No late submissions will be accepted for any reason. Your report must satisfy the following requirements:

- It is a PDF with size 8.5x11 pages.
- It uses font “Times New Roman” (or similar) and size 12 point.
- It is single-spaced.
- It has 1-inch margins.
- It has a title, a list of authors, and a date.
- It has a minimum of six pages and a maximum of eight pages.

Any report that does not satisfy these requirements will receive zero credit. You are encouraged to submit your report early and to follow up with your TA to confirm that it satisfies requirements. (You may resubmit a new draft of your report with the same filename at any time before the deadline.) The two sections of your report will be evaluated as follows:

- (20%) Parameter estimation
- (20%) Control design and implementation

The four sub-sections in each of these two sections of your report will be evaluated as follows:

- Goal
  - (1%) There is a section with this title.
  - (2%) An engineer would understand what you wanted to do after reading this section.
  - (2%) An engineer would know how successful you were in doing what you wanted after reading this section. (You do not have to be 100% successful.)
- Method of approach
  - (1%) There is a section with this title.
  - (2%) An engineer would be able to repeat the experiment that you implemented after reading this section.
  - (2%) An engineer would understand why the experiment was designed the way it was after reading this section.
- Results

- (1%) There is a section with this title.
  - (2%) There is at least one figure in this section. It, and all other figures in the report, have the following characteristics:
    - \* Each figure has a descriptive caption.
    - \* Each figure is labeled, for example, Figure 1, Figure 2, etc.
    - \* The axes in each figure have descriptive and appropriately sized labels.
    - \* The tick labels (i.e., the numbers along the horizontal and vertical axes) in each figure are appropriately sized.
    - \* The lines in the plot (both axis lines and data curves) are sufficiently thick.
    - \* Plots containing more than one set of data contain a descriptive legend that is appropriately sized.
  - (2%) An engineer would understand the extent to which you were successful in parameter estimation and in control design, respectively, by looking only at the figures in this section, even if he or she ignored every other part of the report.
- Discussion
    - (1%) There is a section with this title.
    - (2%) An engineer would understand at least one limitation of the results (e.g., a source of error) and would know how to change the experiment in a way that might improve the results after reading this section.
    - (2%) An engineer would understand the possible reason for at least one difference between predicted and actual results.