

Aerospace Structures Laboratory

AerE 322 Labs, Prelabs, and Writeups

One of the goals for AerE 322 is to provide you with proper training in technical writing and technical communication course. As such, the prelabs and lab writeups are very important and must be done thoroughly and carefully. **All prelabs and lab writeups must be clearly written and well organized.** It is expected that all prelabs will either be written on the computer or be copied over neatly onto engineering paper or similar. All lab writeups must be written on the computer.

Use the checklists below to ensure that your prelabs and reports meet the course requirements. Assignments that do not meet course requirements may receive no grade.

Prelab

Prelabs account for a quarter of your final grade. Prelabs are done on an *individual basis* and then reviewed by your group. **If you don't think you have enough information to do a needed calculation, contact the course staff ASAP.** Depending on the scope and level of difficulty of each lab, expect to spend at least one hour on your prelab. Here are some of the work you should do or areas you should pay attention to:

- Read through the entire lab assignment and prepare a list of actions you will do in lab.
- Answer all questions in the Prelab section of the lab assignment. Perform calculations/predictions and/or provide logical reasoning to support your answers.
- Prelabs should be well organized and clearly prepared using computer or hand written on engineering paper or similar.
- Bring prelab with you to lab. TA will collect and grade them and return them usually in the following week. You will need to keep it until your report is fully graded.
- Review laboratory safety rules. Make sure you wear appropriate clothing to lab.

In lab

- Pay attention to the safety briefing. Review laboratory safety rules.
- Compare prelabs with your teammates. If you have differing designs or approaches you need to develop a consensus approach.
- Take photographs when useful/appropriate.
- Make sure you take measurements of your specimen geometry. One handy trick is to photograph the sample next to a ruler. You will want to take the picture from a distance to minimize lens distortion.
- Perform all actions listed in your prelab and lab assignment.
- Compare your measurements with the predictions/specifications from your prelab.
- Can you identify any sources of error?
- Make sure you mark your specimen with your names.
- Do not leave until you are sure you have enough information for your report and (if appropriate) your next prelab.

Report/After Lab

Lab reports account for *almost half* of your final grade. Lab reports are done on a *lab group basis*. For report template, download “AerE 322 lab report template” in both pdf and MS word format from class web site. Below are common items should be considered:

- Statement of hypothesis
- Evaluation, criticism, and comparison of the pre-lab assignments of each team member. You should discuss differences in conceptual approach, differences in calculation, any errors found, and the root cause of those errors (*We will not use this to reduce the pre-lab grade of any team member*)
- Based on your combined prelabs and team consensus, show the calculations that determine your design, with *numerical results* (Design phase), and/or
- Numerical predictions of quantities to be measured (stiffness, strength, etc.). What was the basis for selecting the approach/calculations from one prelab over another?
- List of actions you did in lab.
- Photographs from lab, as appropriate.
- Measurement results from lab.
- Comparison of measurement results with the calculations above.
- Evaluation of how well measurement results match prelab calculations and what are the sources of error and variation.
- You can add unlimited additional material as an appendix if necessary.
- Answer all questions in After Lab in the Analysis section of the report.
- Well organized and clearly written.
- List of references/credit all outside sources of media, etc. as appropriate
- Neatly computer formatted and submitted as a PDF on the class website by the due date.

If this is a report for the design/construction phase and you do not have numerical results, you don't have to report or compare them. Nevertheless you should make and report measurements of what you have constructed so you can do your test-phase prelab calculations based on “as-built” not “as-designed”.