Professional Report Writing Guidelines

As you write your reports, it's crucial to maintain a professional presentation. Remember, you're not only demonstrating your understanding of the subject matter, but also practicing important communication skills that will serve you well in the real world. Please be aware that *up to 15 points* may be deducted for "unprofessional" submissions. Please adhere to the following guidelines to ensure that your reports meet the necessary professional standards:

- **Presentation and Clarity:** Ensure your submissions adhere to the requirements outlined in Section 7 of the syllabus:
  - Show all work (i.e., no credit for a list of answers without calculations).
  - Be neat and legible.
  - Use the correct units.
  - Do not write in the margins or between lines of the problem set document.

- **Depth and detail**: Ensure you thoroughly respond to lab questions using relevant terminology and concepts being taught.

- **Graphs in lab reports:** Present clear and accurate graphs by following these guidelines:
  - Use straight lines for axes (use a ruler or a computer program).
  - Implement a proper scale (graph paper or plotting software is recommended).
  - Label all axes and include units.
  - Do NOT use college-ruled paper for graphing.

- **Sketches:** You may make sketches by hand and insert a photo, but it is expected that the sketch is neat and uses a straight edge when needed. Avoid sketching on college-ruled paper.
- **Equations:** Type the equations, if possible, for best presentation. If there are too many equations, you may hand write them BUT it is expected that the presentation is very neat and clear.

Remember, your reports should be of a quality that you would proudly submit to an employer, a client, or someone to impress. Demonstrating clarity in your calculations and maintaining a professional presentation are essential skills in engineering and beyond. If you have any questions or concerns about what constitutes a "professional" report, please reach out to course instructor, or consult with your AI.

Lab 5A: Bridge Design

Design and Construction

1. Explain the design of your bridge. This discussion should include but not necessarily be limited to:

   a. Which bridge form have you chosen?

   b. How do the forces move through this bridge form? (ie. which parts of your bridge do you expect to go into tension and which do you expect to go into compression?) Use sketches to illustrate your answer.

   c. Which material packs have you chosen and why? Are some of your materials better at dealing with tension forces and others with compression forces?

   d. How have you ensured that your bridge meets both the loading parameters for the experiment, and the design parameters of vehicular clearance envelopes, maximum deck heights, etc.?

   e. How have you made your bridge elegant?

   f. What, if anything, would you do differently in the design and construction phase next time?

2. Draw your bridge to scale in plan and elevation (see example drawings on the lab procedure document). Use graph paper if this helps. To fit on an 8.5" x 11" sheet (portrait or landscape) these drawings will need to be at 1:2 (meaning that every dimension on the real model should be drawn half as long as it actually is).

Prediction

3. How much load do you think your bridge will hold?

4. Based on what you know about the materials used, the ways the forces will move through the bridge, and the quality of your bridge construction, where/how do you think your bridge will fail?

Results

5. How much load did your bridge actually hold?

6. Draw a quick sketch showing where/how the bridge failed.

7. If you were to construct another bridge and chose to follow broadly the same design, what changes would you make so as to try and ensure your new bridge holds more load?

Lab 5B: Shell Design (Formfinding)

Shell Construction and Design

1. Draw a sketch of your shell. Label the height of your shell and its width at the base.
2. What is the weight of your shell?
3. When using the hanging method for shell construction, when the shell is flipped are the loads present in it tensile or compressive?

Prediction

4. How many more times its weight do you predict that your shell will be able to support?
5. Where/how do you think your shell will fail?

Results

7. How much did your shell actually hold?
8. Where/how did your shell fail?
9. Does this give you any idea about how the forces move through your shell structure? Where do you think the greatest forces are found?
10. If the legs were not tied together, would the shell be able to hold more or less weight? Why?