

Lab Report Style Guide

Materials Science: ENGR:2720

You are responsible to implement the information in this document while writing all lab reports for Materials Science.

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Formatting Requirements

Style

- Divide your report into the required sections. Label each section with the titles listed under the “Sections” heading below.
 - Section titles begin at the left-hand margin.
 - Double space after the title.
- Double space the body of the paper, with 1” margins.
- Use Times New Roman, 12-point font, page #s.
- Put your lab section on all reports.

Clarity

- Write a report that both colleagues and supervisors could understand.
- Present the material in a coherent manner so that an engineering colleague could easily duplicate the experiment.
- Communicate your understanding of the experiment. The written report measures your interpretation of the lab, not the regurgitation of data.
- Come to a conclusion and support your reasoning.

Individual Report Writing

Although you may do the lab work with others, you must write the report on your own. You may neither copy the written work of others nor write collaboratively with others. Doing so is a form of plagiarism and may mean that you receive no credit for the lab. In addition, you may be charged with plagiarism and your instructor or the college may take further action.

For more information on avoiding plagiarism, see the following:

- [“Understanding and Avoiding Plagiarism”](#) (HCTC).
- [“Source Use and Plagiarism Policy”](#) (HCTC).
- [Student Academic Handbook](#) (University of Iowa).

Writing Guidelines

- Use complete sentences.
- Attend to verb tense. Generally, when discussing what was done in the lab, use past tense. When discussing the purpose of the lab and your conclusions, use present tense.
- Do not make bulleted lists for materials, values, equations, references, or anything else.
- Write in the third person. Keep your focus on the subject of the experiment rather than yourself as experimenter.

Example: “The glass shattered when the pressure reached 75 psi.”

NOT: “I shattered the glass when the pressure reached 75 psi.”

- For numbers that are less than zero, precede them with a 0 (e.g. 0.1234).

Word Choice Guidelines

<i>Instead of these words/phrases:</i>	<i>Substitute:</i>
<i>Did, made, saw, etc. (weak verbs)</i>	Collected, reported, determined, created (strong verbs)
<i>Results were found</i>	Results were observed, measured, obtained, calculated
<i>A study/experiment was done</i>	A study/experiment was conducted, performed
<i>Weigh / weight was taken</i>	Weight was measured
<i>Possible</i>	Feasible
<i>Experiment (verb)</i>	Investigate

Sections

Organize your report by the following sections: Abstract, Introduction and Background, Experimental Methods, Results, Discussion and Conclusion, References, Appendices.

Abstract

The Abstract is your report in miniature. It must be placed on a separate page before the rest of the report. Though it appears first, you should write it last. Summarize the report in a paragraph and answer the following questions:

1. What purpose did the lab have?
2. For whom did researchers conduct the lab?
3. What materials did researchers use?
4. What tests did the researchers perform?
5. What result(s) did the researchers obtain?

Introduction and Background

An Introduction should generate interest in the reader. In this section, introduce the subject of the lab and describe the problem that the experiment attempts to solve. The introduction should also include definitions of technical terminology. It may also include who conducted the experiment, where they conducted it, and the date when they conducted it.

The Background section should include theoretical values for material properties such as tensile strength, hardness, coefficient of expansion, etc. You also need to specify the materials tested, including specific alloy composition and/or polymer type. Relevant equations also belong in this section. Briefly describe the equation beforehand and insert it using the equation editor in Word (“Insert” → “Equation”).

Experimental Methods

The Experimental Methods section should describe in detail the test(s) that you conducted and the methods that you used to set up, calibrate, and run the equipment. Include any pertinent photos or figures of the equipment used and caption them correctly (see Guidelines for tables and figures below).

Results and Discussion

Summarize the major findings of your analysis. Include values that you calculate and/or measure. Include additional analyses or experiments needed to improve upon your results. Describe any assumptions that you made and indicate how these assumptions

affected your results. When needed, represent your data in a table or a graph.

Guidelines for tables and figures

- Label all graphs and figures as “Fig. [#].” Label all tables as “Table [#].” Note that graphs are not labeled “Graph.”
- Include important tables and figures in the text of the report. Raw data and less important figures and tables should go in the appendix.
- Always introduce your figures or tables in the text prior to their appearance. If you include a table or figure in the body of the report, you must refer to it in the text first.
- Figure numbers and captions go under the figures. Example:

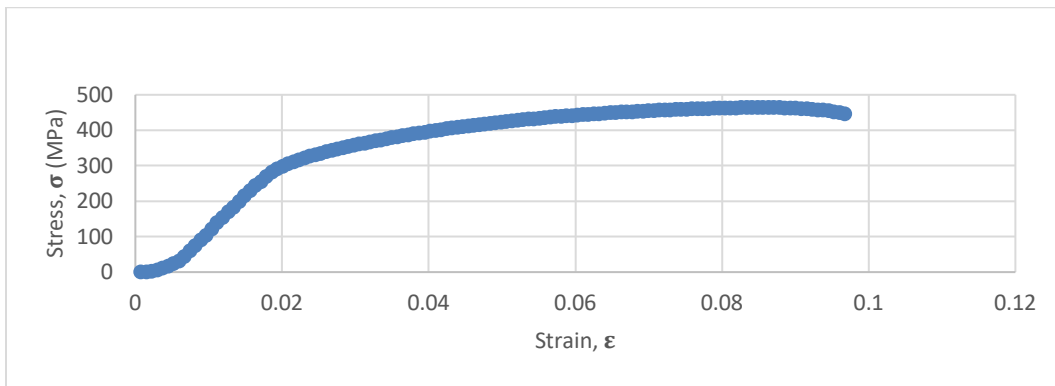


Fig. 4: Stress-strain curve illustrating the elastic and plastic deformation of the untreated aluminum bolt before failure. (Credit: Allison Rowe)

- Table numbers and titles go above the tables. See example Table II.
- Keep all parts of a table together on the same page. See example Table II.
- If your results involve before and after experiments (e.g., before and after heat treatment), or if you are looking at changes in measured properties, express them as a percentage change as well as listing the magnitude of change. Example:

Table II: Hardness test results of 1018 steel before and after water quench

Hardness before Treatment (HB)	Hardness after Treatment (HB)	% change
45	60	+33.3%
45	42	-6.7%

Conclusion

Instead of repeating information from your introduction, provide new perspectives on your experiment. Include a two- to three-sentence summary of the report and offer a recommendation or future implications of the experiment.

References

Create your reference list in APA. Use the APA Documentation Guide, which you can retrieve online at Purdue University's [Online Writing Lab](#).

Appendices

Material that is useful but does not necessarily contribute to the overall presentation of the report should be placed in this section. Do *not* include raw data. Give the appendices titles (e.g., "Appendix A: Tables" or "Appendix C: Example Calculations"). Several items that may be included are:

1. List of Nomenclature and Symbols Used.
2. Figures: Figures not in the text should be placed in an appendix in the order to which they are referred in text.
3. List of Equipment.
4. Methods: Discuss in greater detail how the experiment was performed.
5. Error Analysis: Estimate the accuracy of all measurements. Give statistically meaningful results.
6. Sample Calculation: Give a sample calculation including a unit analysis. Insert typical data into calculations.
7. Theory: If possible, attempt to correlate measurements with a theoretical model.
8. Computer Program: When a computer program is utilized, give a listing with a representative case.