

Short Report Format

Spring 2006

ME 449/549

Overview

Laboratory exercises in ME 449/549 involve fabrication of sensors and experimental equipment, documentation of apparatus, running experiments, analyzing the measurements, and reporting on the results. On some assignments you are allowed to work in teams. For each assignment you are required to submit your own report.

To clarify the reporting requirements we distinguish two types of written documents: a *short report* and a *formal report*. A formal report is a complete technical paper. It contains several sections (*Abstract, Introduction, . . . , Results, Conclusions*) that provide detailed information to a reader unfamiliar with the laboratory equipment and objectives. A formal report is only required for the final project. Details on the structure and content of the formal report will be provided in a separate document.

Grammar and style of writing matters. Poorly written documents distract the reader from the key technical information being presented. Well written documents make the information easier to understand. Quality of writing and adherence to professional standards of organization and completeness will account for up to 25 percent of the grade for each report.

Short Report

The short report format is more like a homework assignment than a formal technical paper. A short report provides answers to questions posed in the assignment sheet for a specific laboratory exercise. It is not necessary to restate the question in the body of the report. However, your answers should be in complete sentences.

Report Content

A short report should contain the following parts.

- **Lab Exercise number, title, author, and Lab Partner.** These components need not be on a separate title page, but should be clearly visible on the first sheet.
- **Overview.** Provide a brief overview of the objectives and results of the lab. The overview provides helpful background for a reader who is unfamiliar with the class. Assume that reader is an engineer with experience in the technical content, but not with the specific equipment, procedures, and objects of the specific exercise. The overview should consist of one (or maybe two) paragraphs of prose. Include one or more schematics of the apparatus in your report. You are hereby given permission to copy

figures from class notes and assignment *as long as* you give attribution. I recommend adding “Figure from ME 449 assignment sheet”, or “Figure from ME 549 class notes” to your figure captions when the figure is copied from the class materials. This standard of attribution also applies to any graphical images taken from the internet or other publications.

- **Lab Exercises.** Provide the documentation requested in the laboratory assignment. Write a brief narrative (one to five sentences) for each major section. Assume the reader has access to the assignment sheet. Write in complete sentences.
- **Conclusion.** Briefly (one to five sentences) summarize the outcome of the entire exercise. Were the original objectives met? Did the results match your expectations, or a theoretical model? How could the exercise be improved?

Report Style

The report should also be formatted according to common technical writing standards. When in doubt, imitate an article from a professional journal (not a marketing article from a company) or a respected textbook.

- Each page after the first sheet should have a clearly displayed page number. If the cover page is a separate sheet, the first page of text should have a page number.
- Equations can be *in-line* or *displayed*. An in-line equation is incorporated in a sentence, and it should flow with the text of the sentence. The following paragraph contains an in-line equation.

The thermal resistance of the balsa block is $R = L/(kA)$, where L is the thickness of the block in the direction of the heat flow, k is the thermal conductivity of balsa, and A is the area normal to the direction of the heat flow.

Each variable in the equation is defined in the flow of the text. Variables are most often defined immediately after the equation is written.

Displayed equations are centered on their own line. There is extra vertical space between the equation and the text preceding the equation and following the equation. Often a displayed equation will have an equation number that is aligned flush with the right margin. Here is an excerpt from a technical document containing a displayed equation.

The average heat transfer coefficient on the surface is

$$h = \frac{Q/A}{\bar{T}_s - T_\infty} \quad (1)$$

where Q is the rate of heat loss by convection, A is the area of the surface, \bar{T}_s is the average surface temperature, and T_∞ is the temperature of the fluid approaching the surface.

Note that in both examples, each term in the equation is defined immediately after it is introduced. Also note that the definitions of each term is written in a phrase that could stand alone as a sentence, as in

$\underbrace{k}_{\text{noun}}$ $\underbrace{\text{is}}_{\text{verb}}$ $\underbrace{\text{the thermal conductivity.}}_{\text{object}}$

- All Figures and Tables must be numbered, and must have a meaningful caption. Figure captions are usually below the graphic as in the example at the top of the following page.

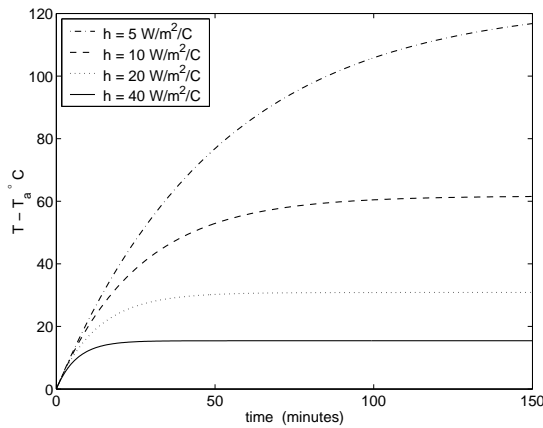


Figure 1: Prediction of block temperature versus time during the start-up transient.

Table captions usually precede the table as in this example.

Table 1: Measured heat transfer coefficient and uncertainty of the heat transfer coefficient as a function of approaching air velocity.

V (m/s)	h (W/m ² /°C)	u_h (W/m ² /°C)
1.0	30.1	1.9
1.5	40.7	2.1
2.0	55.3	1.2
2.5	68.0	1.4

Note that the axes of the plot in Figure 1, and the columns in Table 1 include the units.