

# LABORATORY REPORT FORMATS

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## Introduction

Each laboratory exercise requires a report of some sort. This document provides guidelines for writing laboratory reports. Specific instructions for the report should be given with each exercise. Check with your instructor if any instructions are not clear.

## Laboratory Reports

The report is an account of your work in the laboratory. There are two target audiences for reports:

- The first audience consists of people with a background similar to yours (e.g. other engineers, technicians, etc) who want to be able to duplicate your results. For this purpose, we will use a *formal* report.
- The second audience consists of people who have some understanding of the process/problem and want a clear, concise presentation of the results (e.g. managers, other semi-interested engineers, etc.). For this audience, an *informal* report is appropriate.

### Formal Report

A formal report should contain the following items:

- **Title Page.** The Title Page should contain the course name and number, the experiment name and number, the names of *all* laboratory team members, the instructor's name, and the date. All of this information should be centered, near the top of the page. The Abstract should appear at the bottom (see next point).
- **Abstract.** The Abstract is a *short* (one paragraph) description of the objective of the laboratory exercise, the results obtained, and your conclusions. It is brief yet descriptive enough that an interested person conducting research could read the abstract and make an informed decision about looking further into the report. The Abstract should appear at the bottom of the title page.
- **Introduction.** The Introduction section provides a short description of the problem being addressed in the laboratory exercise. It is an explanation of how the objective of the laboratory is achieved and provides enough background for the reader to fully understand the rest of the report.

- **Procedure.** The Procedure section describes the processes and steps in the conduct of the exercise. It contains system diagrams, equations as appropriate, and an explanation of any equipment or measurement techniques employed. *Remember, this should be detailed enough that someone could duplicate your results.*
- **Results.** The Results section displays what you found. It may use tables of data, graphs of data, screen captures of oscilloscope displays, and narrative discussions. Be sure that your data/information are clear and unambiguous.
- **Discussion and Conclusions.** The Discussion and Conclusions section should interpret your results. If there is a particular conceptual insight revealed in the exercise, it should be discussed. If there were difficult or unusual aspects of system construction or measurement, they should be discussed. Be sure to write this section in the context of the objective of the exercise.
- **References/Appendices** (if needed). This section is included if you need to reference books, articles, websites, etc. or include additional documentation. All listed references must be *cited* somewhere in the report.

### Informal Report

An informal (or memo) report should be prepared as an *interoffice memorandum* with the following items at the top of the first page. There is no title page.

Date:  
To:  
From:  
Subject:

The "From:" line should contain the names of *all* laboratory team members with the first name being the person who is submitting the report.

The rest of the memorandum should be organized as follows:

- **Summary.** Similar to the abstract of the formal report, the summary should *summarize* your work in the lab. Include the same information as in the *Abstract*.
- **Results** (and **Procedures**, if needed). Since your audience is familiar with the work you are doing, typically, you only need to explain what you found. The exception to this is if you use an *unusual* or *unfamiliar* procedure. Then, you will need to explain this to your reader(s).

- **Conclusions.** Again, this is similar to the formal report and is where you discuss what your results mean and how they affect the reader. Think of your instructor as your supervisor. He/she will want to know why your results matter and what it means to the “company.”
- **Refereces/Attachments** (if needed). Same as formal report.

## Equations, Graphs, and Graphics

### Equations

The report must be prepared with word processing software such as Microsoft Word, and all equations should be prepared using Microsoft Equation Editor or similar software. There is a comprehensive set of standards used to prepare typewritten text containing equations, and they are described in various publications. Some of the major elements of the standards are

- All variables are written in italics. For example,  $v = Ri$ .
- All units are written in Roman (upright) text with a space between the number and the unit symbol. For example, 10 V.
- Well-known functions such as sine and cosine are written in Roman (upright) text. For example,  $\sin(\omega t)$ .
- Matrices and vectors are written in bold Roman (upright) text. For example,  $\mathbf{v} = \mathbf{Ri}$ .

Microsoft Equation Editor makes adherence to these standards very straightforward. If not using Equation Editor, be sure to still follow these standards.

### Graphs

Graphs also have widely accepted standards that include

- All graphs must have axis labels and a title.
- If there are multiple plots on the same graph, a legend is essential.

Microsoft Excel makes adherence to these and other accepted graph preparation procedures very straightforward, and all graphs must be prepared using Microsoft Excel or similar software.

*Note:* When a graph or any information is prepared in landscape format, the page must be oriented in the report so that the bottom of the page is to the reader’s right.

### Graphics

Graphics in your report, such as system diagrams, should be prepared using software with graphics capabilities. Examples of such software are PSpice, Microsoft Word, Adobe Photoshop, AutoCAD, and SolidWorks. Figures should be properly sized and easily readable. Avoid scanned images or images copied from another document, unless absolutely necessary.

*Note:* Use the Microsoft Word “Crop” tool to eliminate unnecessary parts of figures to make them fit better and clean up the document.

**When using a picture from another document, you MUST cite where it came from!** Failure to do this is plagiarism. See the website for the Baylor Office of Academic Integrity: <http://www.baylor.edu/honorcode/index.php?id=44008>.

### References

Eisenberg, Anne, *A Beginner's Guide to Technical Communication*, McGraw Hill, 1998.

*IEEE Standards*, Various

Nardizzi, Louis J., *Basic Circuits and Electronics Experiments*, D. Van Nostrand, 1973.

Slutsky, Elliot B. and David W. Messaros, *Introduction to Electrical Engineering Laboratories*, Prentice Hall, 1992.

Wolf, Stanley, *Guide to Electronic Measurements and Laboratory Practice*, Prentice Hall, 1973.

Alley, Michael, Ed. *Writing Guidelines for Engineering and Science Students*, Penn State, 2008, <http://www.writing.engr.psu.edu/>.

*Electrical Engineering Department: Report Formats*, University of Wisconsin – Platteville, 2009, [http://www.uwplatt.edu/ee/TechDoc/rpt\\_formats.pdf](http://www.uwplatt.edu/ee/TechDoc/rpt_formats.pdf).

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