# Electrical Lab Reports

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**Introduction**
A laboratory report records precisely the procedures followed in conducting a laboratory experiment. Every discipline, every course, and every professor seems to require a different format and style, and different kinds of laboratory experiments are often reported in different ways. The format appropriate to Electrical Lab includes:

1. Front Matter
2. Objective
3. Equipment used
4. Procedure
5. Results
6. Discussion
7. Conclusion
8. Back Matter

**Front Matter**
Report front matter includes:
Title Name
Experiment No.
Date
Partners

**Objective**
The objective of your experiment should be stated clearly and concisely, in one or several sentences.

*Example:* The purpose of this experiment was to determine whether measurement of the changes in air-to-earth potential gradient could be used as a reliable and practical method of predicting local thunderstorms.

Revised 02/02

**Equipment**
Do not give details that are common knowledge in your field. Provide information of particular interest, such as the brand name and model of complicated apparatus or unusual equipment (e.g., *Oscilloscope —Tektronix -Model 561B-CRO-158, Serial # XXXX*).

**Procedure**
For the purposes of the Electrical Lab course, it is sufficient that you state the source of the procedure that you have used. If you deviated from the given procedure, describe the procedural changes you made.

If you were documenting your research for audiences that were not familiar with the procedure, then you would need to state the procedure fully, in chronological order. You would provide enough information so that another researcher in your field could use your description to replicate the experiment.

**Results**
Provide a sample calculation, using one complete set of data. Give the results of the calculations for the rest of your data. It is not necessary to recopy your raw data from the page where you first recorded it. Refer to it as necessary, pointing out trends and identifying special features.

State the results of your experiment clearly. Figures, graphs and tables may help to support your claims, but do not rely upon them exclusively to convey essential information. Any figures or tables used should be labeled and given a reference number (e.g., *Figure 1, Input Frequency and Capacitor Value*).

State all significant results explicitly and in verbal form. Organize your paragraphs around effective topic sentences. Use short, declarative sentences for the most part, but vary sentence length for flow and emphasis.

**Discussion**
Your discussion is the single most important part of your report. In it, you will show your reader that you understand the experiment and can interpret it. Analyze and explain your results, focusing your attention on questions like these:

- What results were expected? What results were obtained? If there were any discrepancies, how can you account for them?
- Do any of your results have particular technical or theoretical interest?
- How do your results relate to your experimental objective(s)?
- How do your results compare to those obtained in similar investigations?
- What are the strengths and limitations of your experimental design?
- If you encountered difficulties in the experiment, what were their sources? How might they be avoided in future experiments?

**Conclusion**
The body of your report should end with a brief concluding statement, similar to an abstract, which summarizes the significant aspects and results of your experiment. It should tell the reader why the experiment is significant and what implications its results have for your field of study. If your experiment confirms or contradicts an established principle or theory, this should be stated clearly. In the plainest terms, your conclusion should answer the question, "So what?"

**Back Matter**
Include references for your sources of information as appropriate. Your instructor will inform you as to how references should be cited, or may refer you to the IEEE Standards Style Manual. The Institute of Electrical and Electronics Engineers, Inc. publishes the IEEE Standards Style Manual, which describes the optional and required contents and referencing conventions of drafts for working groups and instructions on submitting drafts for IEEE-SA Standards Board approval and publication.

The 2000 revision of the IEEE Standards Style Manual has been substantially reordered and reorganized and available online at http://standards.ieee.org/guides/style/. A copy of this Manual is also available at the Consultant’s desk in the Writing Center at Rensselaer.