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Course: ECE 3210

Subject: Lab 1, Lab Basics

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1 Introduction

Many times in “real life” experimental situations, a full-scale formal technical report is not necessary, nor is it effective. A brief “Technical Memo” is used. This technical memorandum, sometimes called an executive summary, is less formal than the full report. It is not a permanent record of the work, and hence does not include all the details and data that should be included in a formal report. It can be a very common way of disseminating information within an organization. In particular, it is used to summarize the results of technical work to non-technical colleagues. The memo should be limited to two-pages of text, single columns, single-spaced, with an 11-point font.

The introduction section of the memo should cover what the basic idea of the lab is. It doesn’t need to be particularly long, but it should be more than a single sentence.

2 Theory

The theory section of the memo should cover the theory behind the lab. For example, if there is a derivation needed, include that here. When you write up a derivation, you don’t need to show every single step of mathematical manipulation, but you need to include enough steps such that a typical engineer could follow it. You must typeset your equation using the \LaTeX equation editor to make it look good.

For example, suppose we need to compute the complex exponential Fourier series coefficients for a saw-tooth waveform. We know that $T_0 = 2$ and $\omega_0 = \pi$. We write out the integral we need to solve

$$D_n = \frac{1}{2} \int_0^2 t e^{-j\pi n t} dt. \quad (1)$$

We don’t need to go through and show every step of the derivation. It would be sufficient to say that solving the integral yields

$$D_n = \frac{j}{\pi n}. \quad (2)$$

3 Results

The results section covers the results from the lab. Your data will mostly be represented in plots and tables. Include those figures AFTER the main body of text on a new page. Data interpretation (what the plots *mean*) should be reserved for the Conclusions section of the memo. You should comment on the trends of what you have seen, but do not explain *why* you are seeing them in this section.

As an example, Fig. 1 is an example of what a proper figure should look like. Each figure should be properly labeled with decently sized fonts. In the results section, you could comment on the oscillations in $v_2(t)$, but don’t speculate why those oscillations are there. We can also include data in a table. You can see an example table in Tab. 1.

4 Discussion and Conclusions

The conclusions section is for interpreting the data. If you see a trend in your data, explain why you see it in this section. Use the theory you learned in class in your explanation.

As a final note, you are expected to use this document as a template for your lab submissions. You are welcome to upload this to overleaf to edit/compile the document. Or you can work locally using whatever flavor of \LaTeX compiler you prefer. All you need to do is to upload the document (and not the \LaTeX source) to Canvas.

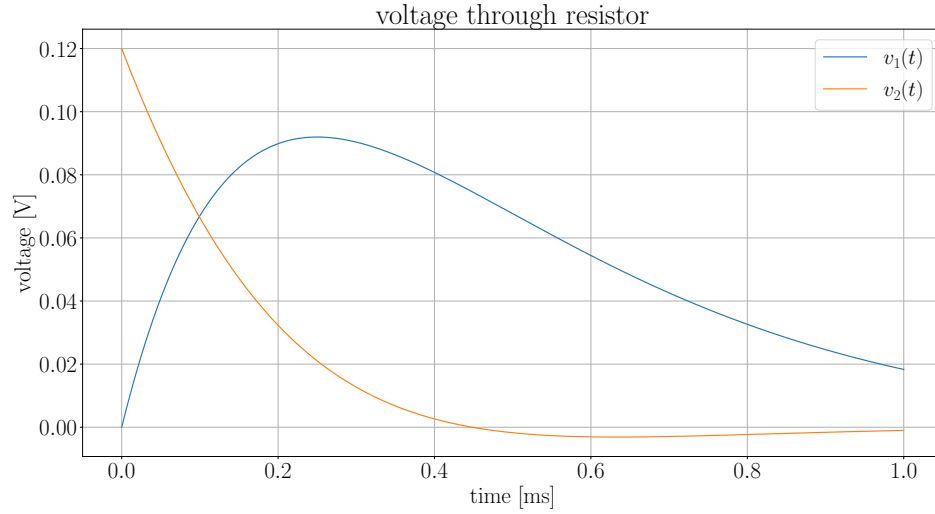


Figure 1: every figure need to have a detailed caption! Most of the time people will read technical documentation and just look at the figures, so using more detail in the captions is helpful.

Item	Quantity
1 k Ω resistor	1
0.033 μ F capacitor	1
1 mH inductor	1

Table 1: an example of a table. Once again, please provide a detailed description of the table in the caption.