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Laboratory Rules And Procedures

I. SAFETY

1. Do not touch equipment until instructed.

2. NO student may use the lab equipment alone at any time. A student must be accompanied at all times by a laboratory partner and/or a lab instructor. This rule is observed for regular as well as make-up lab sessions.

3. Report all dangerous conditions (stripped AC lines, sparks in equipment, loose wall socket, etc.) to your lab instructor.

4. If a piece of equipment does not turn on or stops functioning properly, report it to your lab instructor immediately.

II. HONOR CODE

The Honor Code applies to all laboratory work, which means the pre-lab preparation, the experiments and the final lab report. You are expected to include the following Honor Code statement on all your work:

“*I have neither given nor received aid on this report, nor have I concealed any violation of the Honor Code*”

III. COLLABORATION POLICY

You are encouraged to work with your laboratory partners and/or with a group of friends on the pre-lab, lab-reports and homework problems. However, you may not copy the work of anyone else (enrolled in the class or not) and you should write your own work without looking at other peoples’. You are allowed to help (or receive help from) your colleagues in the form of discussing the work, explaining the problem and even describing (or learning) in detail how to solve a problem (verbally with few sketches), but the work you turn in should be yours and no one else’s.

IV. GRADING POLICY

The lab grade constitutes 20-25% of the total grade for the course. For each experiment, the lab grade is roughly distributed as follows:

- Pre-lab 15%
- Lab Report 75%
- Participation 10%

Any student missing a lab experiment (not present in the lab) with no proper or reasonable excuse will get a zero “0” grade for that lab experiment. If a student misses a lab experiment with an acceptable excuse, he/she will be allowed to make it up by the laboratory instructor.
V. LABORATORY PROCEDURE

Each lab experiment is designed to be performed within the 3-hour laboratory time. During each laboratory period, you will be expected to carry out one experiment, to record the experimental data, to make a few computations to determine how it agrees with expectations, perhaps plot some graphs, and then answer some questions concerning the experimental work. The laboratory instructor will then sign on your notebook before you leave the lab. You will then prepare the final lab report which is due one week after your lab session. To successfully complete the experiments in one lab period, you must come prepared to the laboratory. You should read the experiment in advance and answer the pre-lab questions. The pre-lab counts for 15% of the lab grade. Always bring the following items to each lab session:

1. Your lab notebook (with numbered pages).
2. An INK pen (color is a plus), and a pencil.
3. A calculator capable of sin, cos, log, ln, $e^x$ functions.

Always use an ink pen when you enter data and other information in your notebook. If you make a mistake, neatly cross it out and continue on. If a graph is incorrect, cross it out too with a large X, draw a line and continue. No points will be deducted for crossed-out material, as long as it is neat. However, lab reports with hash marks all over the place, data presented in haphazard fashion and general sloppiness will suffer as much as 50% penalty (in severe cases) on the final grade.

The following guidelines will result in a good lab report:

1. Always put a Unit (V, A, Hz, ...) after every quantity or answer. Underline your answer or place a box around it.
2. Always label the axis on a graph and give the units too.
3. When using an equation, write it out first in analytical form (Ex.: $R_p = R_1R_2/(R_1 + R_2)$) and then substitute the data.
4. Sketch a circuit diagram or a system diagram neatly and label the component values.
5. Sketch an experimental diagram and label the equipment used.
6. Comment on the agreement or lack of agreement with the calculated values. Also comment if the measured results are unexpectantly too high or too low. It is rather OK to have done an unsuccessful experiment but it is NOT OK to accept the data as it comes without thinking about it, questioning if it makes sense, and knowing finally what went wrong!

In the lab report (due one week later), you are asked to further analyze your results, answer a few questions and calculate a few things. The lab report should be written in your lab notebook. Please write down any special difficulties you encountered in the lab and your suggestions for any improvements (highly appreciated).

*Start Lab Exercise 1 on page 2. Leave page 1 blank so you may use it later to generate a table of contents for your lab notebook.
The Lab Notebook

In industry, the lab notebook is not just where you doodle down things related to ideas or measurements. The notebook is a legal document, which can be used to prove that you discovered some phenomenon and that you are the person that deserves the credit (or, put a slightly different way, that your company deserves the profit). Not only can the notebook be used to protect you from someone trying to steal your ideas, it can also be used to prove that you didn't steal an idea, either.

In order to be a legal document, the lab notebook must be bound, so that no pages can be added or removed. The cover may be hard or soft, but the pages must be numbered, as proof that no pages were added or removed. Numbered pages also make it easy to index your notebook, so that it can be used effectively as a reference. You can number the pages of your own bound notebook, but it is easier to purchase a bound notebook with the pages already numbered.

As you fill in the pages of your notebook, record the date on each page as you start to fill it in. Start a new page every new day, regardless of how much space was left on the last page.

Everything you write in the notebook should be written in non-erasable ink. The only exception is for calculations. Once made, observations cannot be undone, so they should be recorded in a permanent fashion. If for some reason you suspect a measurement or observation to be in error, simply cross out the bad data and put a new (hopefully better) data down next to it. Somewhere on the same page write down an explanation of why you suspected the data you crossed out to be incorrect. Put only a single line thru the bad data. Do not cross out bad data such that it cannot be read: you might be wrong twice and the original data might have been good!

Calculations may be done in pencil, as an error in calculations can be corrected. Pen is OK, too.

Sometimes things get on paper that is not in your bound notebook and you wanted to include them in your notebook. An example might be a plot generated on a computer and sent to a printer. Make a copy, or, preferably, take the original, and staple, glue or tape it into your notebook at the page you are working on. There are techniques, like signing your name across the edge of an included document and onto the notebook page, that insures that the inclusion is genuine, but that won’t be required in this class. (If you make any new discoveries, we’ll take credit. Thanks.)
Grading the Lab Notebook

For the EECS 230 and 330 labs, buy a bound notebook with page numbers. Write your name on the first page and leave the rest of it blank, so that it can be used later for a table of contents when the notebook is full.

Because we need to grade your weekly lab reports, we’re going to use the following procedure:

- Write the answers to the pre-lab in your notebook before the lab.

- At the beginning of the lab, the GSI will initial at the bottom of the pages with pre-lab assignment.

- Record the data taken during the lab directly into your notebook.

- When you are done getting the data, get the GSI to initial the bottom of pages with the data.

- Write up the lab report using the data in your notebook. If you write out your report by hand, do so in ink. Attach the photocopied pages with tape, staples or glue to your report.

- One week after the data was taken, a copy of the lab report must be handed in to the GSI.

- Two weeks after the data was taken, the GSI will return your graded report.

- Attach the report to the back end of your notebook.