Laboratory Work

Laboratory work will primarily be done in two person teams. Occasionally, individual work may be required. A portion of your lab grade may be based on your performance in laboratory. Students who mistreat the lab equipment or are not prepared to perform the experiment will receive a low laboratory performance grade.

Poorly written lab reports will receive failing grades. A professor may require the resubmission of poorly written lab reports.

Lab Notebooks and Pre-Labs

Each student will keep an individual lab notebook. The lab notebook will contain all pre-lab work and all data taken during the lab period. Each page will be signed and dated by both the student and the professor. The lab notebook must be in a bound volume and lab handouts and computer generated data tables should be pasted or stapled into the notebook. (See the Lab Notebook Guide for more information.) Unless specifically permitted by the instructor, all work (including computer simulations) presented in the pre-lab should be your own work, not a joint effort with classmates. All pre-labs must include detailed drawings of the experimental setup, including measurement device placement, and tables with columns for entering both theoretical and experimental data, allowing for immediate comparison. No late Pre-labs will be accepted.

Lab Reports

Each laboratory report must be prepared in accordance with the following format:

Title Page:
The title page will include the following information centered on the first page:

Course, experiment number & title
Submission date
Name of the student submitting the report
Names of any lab partners

The following statement should appear, signed and dated, at the bottom of the title page:

The work contained herein is my own.
I have neither knowingly given nor received any portion of this laboratory report.

Body of the Report:
The body of the report should be organized as follows:

Introduction: In your own words describe the objective(s) of the experiment, the pertinent background information, and the general principle you are trying to confirm.

Procedure: Describe what was done and explain its relation to the introductory information. A blow-by-blow description of what was done is not required. Something similar to the following is sufficient: "...the circuit shown in Figure 3 was constructed and the following measurements were taken...etc." Your report will not be graded on weight.

Presentation of Data/Discussion of Results: Present and explain the data collected in the lab. (Remember a picture is literally worth a thousand data points!) In this portion of the report, you should also compare the theoretical results with the experimentally determined results. You should calculate and tabulate the percent difference between the theoretical and experimental results. You should make an effort to explain any differences. Blaming poor results on the resistance of wires or faulty equipment is not an analysis of the results - this usually accounts for a miniscule error. If you believe statistical variations of components are to blame, perform an analysis to test your hypothesis. Good prior preparation coupled with an immediate comparison of the experimental results with the theoretical results should eliminate gross experimental errors.

Conclusion: Describe how the general principle was supported by your findings. In this portion of the report, you should briefly comment on what you showed from the experiment. You should concentrate on the theory vs. practice as it applies to the work done in the laboratory experiment. Don't include statements concerning your individual experiences or feelings about the lab that do not apply to the experiment.
GUIDELINES FOR LAB REPORTS

WRITING

- The writing should follow standard technical writing style. Descriptions of procedures and results should be in past tense passive voice while discussions of results should be in present tense passive voice. In passive voice, personal pronouns (I, we, us, etc…) are not to be used.

  The second order RLC circuit shown in figure 2 was constructed in the laboratory. A 10Vp-p square-wave was used as an input signal, and the frequency was varied from 100Hz to 100kHz.

  Data were collected on September 14, 1999, using an HP54602 oscilloscope. Figures 4a and 4b show the magnitude and phase gain for the circuit under investigation. As can be seen from the magnitude gain plot, the gain is unity at the resonant frequency of the circuit.

- Avoid wordiness - be brief and to the point. However, the report must stand on its own. The report must not refer to the laboratory handout text or figures.

- Proper grammar, punctuation, and spelling are expected.

FORMATTING

- All reports should be typed using a word processor in 10 or 12 point type; formulae should also be typeset using an equation editor (both Word and WordPerfect have these).

- Use the same font and form for all of your headings.

- The left and right margins of the report should be one inch.

- All the pages in your report should be numbered.

TABLES AND FIGURES

- Each table and figure should have a title, a number, and a caption below the figure or table. Figures and tables are not stand-alone items; they must be referenced in the text by title and number.

- Computer output should be imbedded in the text. Scanners are available in the computer lab in Bond 258.

- Variables in figures and tables should have units associated with them (for example: mV, MHz, etc…)

- All results should reference a properly labeled circuit diagram where appropriate. This reference should include a figure number and page number.

- Understand when to present data in a table and when to present data in a graph. Tables of data should be used when there is no relation between subsequent datum. Graphs should be used when there is a relationship you wish to show. For example, comparisons of theoretical vs. measured component values should be placed in a table, but a voltage vs. frequency should be presented in a graph.

- Equations, ideas, designs, etc. that are obtained from other sources should be noted and the source cited as a reference. The references should appear numbered at the end of the report. The reference in the body of the text should appear at the end of the sentence in brackets or next to an equation in brackets. See the example below:

Results

This sentence has a reference [1].

References