Laboratory Reports and Laboratory Procedures
EE 230
Spring 2010

All laboratory reports should be stand-alone documents that a graduate electrical engineer can read and understand without any reference to the laboratory handout. What you did, what your conclusions are, and why it is relevant should be clearly conveyed in the report. The laboratory handout will describe some experimental procedures for you to follow but you may find that in some cases you need to do things beyond what is specifically asked for to better understand a concept.

On occasion you will observe something new or interesting or come up with a clever way of taking a measurement or solving a problem. The laboratory report is a great place to report these contributions.

Circuit schematics are a critical part of essentially all experiments in this course and schematics of all circuits used should be included in the laboratory report. Circuit schematics should be complete, that is, all components should be labeled, any voltage or current discussed should be designated on the schematic, and all component values should be labeled. The method of making any reported measurements should be stated.

Graphs, plots, and tables are often very effective for communicating theoretical and experimental results. All such figures should have descriptive titles and all axis should be labeled. If multiple results are included on a figure, be sure to clearly label each function. Any data presented in the report that is not labeled or discussed will be ignored when grading the report.

Prior to taking measurements you should always ask yourself what response is expected and compare measured results with theoretical results or anticipated results. In most cases the anticipated results are best obtained with analytical calculations and, in some cases, the anticipated results will also be obtained with some type of computer simulation such as with MATLAB, Spectre, Excel, C++, or some other tool. A comparison of anticipated results and measured results should always be included in the laboratory report. **Any discrepancies between anticipated and measured results should be resolved in the laboratory, not in the laboratory report.**

Calculations or in some cases simulations necessary to understand the theoretical performance of the circuits should be completed before coming to the laboratory. Your TA may specifically ask to see some pre-lab results on some experiments but whether or not you are asked for specific pre-lab results, it is expected that you come to the laboratory with pre-lab calculations complete.

The format you choose to use for the report is up to you. There are many ways to prepare a good laboratory report. Your report should be reasonably neat and legible but need not be computer generated. For example, circuit schematics can be hand-drawn or "cut and pasted" if it will save time. Assuming the report is reasonably neat and legible, major emphasis on grading the report is on content.

At most two students will work together on any experiment and when two students are working together, a common report can be turned in. The TAs will periodically assign laboratory partners in advance of experiments. All measurements made must come from the joint work of the two students. No data from anyone else should be included in a report unless included in a way to draw a comparison between

results you obtained and results obtained from someone else. In the latter case, permission should be obtained from the person that obtained the other data and credit to the source of the specific measurements must be acknowledged in the report.

A bound laboratory notebook should be used in the laboratory. No pages should be removed from the notebook throughout the course. You will not be graded for neatness in the laboratory notebook as long as the results are legible but you may be graded, on occasion, for completeness in the laboratory notebook.

Situations often arise where it may appear that a piece of equipment in the laboratory is not functional. With the exception of an occasional "crash" or installation issue with Signal Express (which we hope to resolve shortly), the equipment in the laboratory seldom fails. With the exception of occasionally finding a fuse internal to the signal generator is blown, there is seldom a failure with any of the other test equipment in the laboratory. It is unlikely that there will be a failure of more than one or two pieces of test equipment in the laboratory throughout the entire semester. As such, when a circuit is not working as expected, experience shows that the problem is almost always one of the following.

1. Circuit is not correctly wired
2. Test instruments not correctly connected
3. Test instrument not correctly operated
4. Component value not correct
5. Active device burned out
6. Defective protoboard (rare)
7. Defective test lead or probe (rare)
8. Defective piece of test equipment (extremely rare)

In the rare situation where there is a defective piece of test equipment, make it known to the TA immediately and, if detected when the electronics shop is open, we can usually get it replaced with minimal delay.