

General Instructions for doing Labs and Format for EE431 Lab Reports

rev. May 16, 2011

Doing the labs: Please start the lab soon after it is handed out so that there is time to ask questions should some steps not work right. Labs are due on the last class night (Wed. or Thr.) of the second week after the lab assignment is made. You are encouraged to hand labs in early. **Late labs are penalized 15 points per class late.** However, because there are all kinds of conflicts in this complicated world you have a total of four free class days of late hand in to use as you need. Thus, if you need an extra day for whatever reason then fine – I do not need to know why. You can hand in up to four labs one day late, or two labs two days late or even one lab four days late with no penalty – however all labs must be handed in by the last class day when the free days expire. The management of this is up to you. This way I do not have to reschedule labs although if there are certain types of problems I might extend a due date – but do not count on it.

Students should work all labs individually although feel free to help each other out – that is the kind of teamwork you must perform on a job. But do not copy data and calculations – that may be considered cheating with the usual penalties. **No group lab reports.** Each lab report should be individual and I should not recognize matching patterns to other lab reports – present or past. If I do see patterns of copying then there is going to be trouble as somebody is cheating.

A key to successful lab experiments is in good construction methods for building the circuits. Be sure to use short lead lengths, ground plane, power supply decoupling, and bussed ground and power supply connections as discussed in class and in some of the application notes referenced on the web site. Connect ground and power supply circuits first and then check the connections as mistakes are often made in power supply distribution. Then build the actual circuit taking care not to work so fast that mistakes are made. Mistakes really slow things down and make labs miserable. Be sure to take enough notes to complete the lab report. Be sure to do calculations as you go so that if the results do not make sense you can figure out what you did wrong and correct mistakes. It is too late to wait until you write the lab report to figure out that portions of the lab were done wrong and data taken is meaningless. If you discover errors in your lab work then repeat those parts of the lab and take new data – it is not acceptable to say that there was some malfunction but you expect to receive a good grade anyway – life is about results, not excuses. All lab reports should reflect a lab experiment where everything worked well enough to understand the concepts. This way the student gets the most out of lab and the report is easy for me to grade and the student earns a high score.

Plagiarism: There is one troubling aspect that has plagued EE431 (and EE351 too) labs for many years. Some students copy either old labs (won't work now as I am changing them all) or copy labs of their fellow students. Even though I can not prove it I know for a fact that it happens because it is very suspicious that a student will have turned in an 'A' lab but yet be totally clueless on tests with related questions. The concept is to do as little as possible to slip through the course and others to obtain a degree that essentially states "*John Smith are a enjaneer*" so that an otherwise unemployable John can be given a job in government or some quasi government. I know that there are a number of real

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students who do in fact do all of the labs themselves as they are really trying to learn – that is what this is all about. Although it should only take two to three hours to do the lab they might spend a total of over six hours trying to get things right. They might later realize they made an error and go back to redo some part of lab. That is the dedication of a real engineer and such students should feel pride. Sadly, they sometimes make mistakes that cost them points. Contrast this with some other students (pseudo students) for whom I have no doubt copied someone else's 'A' lab from the past. Is it fair for the real student to receive a 'B' and the pseudo student to receive an 'A'? No!!! But unfortunately I am stuck. I generally do not trust anything handed in as I know cheating is rampant. But I also know there are really good students – not all make an 'A' or even a 'B'. So what do I do? I am working on some schemes to rig the tests to favor the real students and cause pseudo students to have lower scores. There are some other subtle rigging of the labs themselves year to year that may be employed to nail (i.e. a grade of 0) someone copying an old lab. I have an agenda to stamp out cheating. I think in terms of the Clint Eastwood line, "Go ahead. Make my day."

All students should safeguard their lab reports and data. Do not leave computer files for others to find (that has happened). Do not throw drafts in the trash for others to find (that has happened too). Do not allow other students to copy your lab data, etc. Those students need to manually do that work for themselves. Be careful about helping some students too much – some pseudo students are crafty at making the rounds and obtaining a little help from enough different members of the class to build up a lab report for a lab they never did. I have known of this phenomenon on the job as well. It is one thing to be nice and helpful. It is another to be used. Be nice but don't be used. Sometimes life requires you to be ugly.

Lab reports: A necessary unpleasantness in teaching is grading papers. It is not fun grading lab reports. But since lab is a part of the course there has to be some objective measure of student performance so lab reports are required.

To make the report easy for you to write and easy for me to grade you should use the following as a guide.

- The sequence of the report should exactly match that of the lab assignment.
- You should write just enough text to convey what you did but no more – think in terms of completeness with brevity – this is the preferred style in industry. But do not be so brief that your work can not be understood. Your report is informal so do not worry about formal precise details. I am not an English teacher grading you on the fine points of writing. But then, your writing should not be an embarrassment for a senior college student.
- Include all circuit diagrams, plots, and calculations in the proper sequence and have some text that briefly explains/discusses them.

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- You do not need to submit original raw data written by hand on odd paper. Typed tables from that data are preferred.

- If I can not follow the lab then I can not give you full credit.

Instructions:

Download and edit the lab number, the lab title, the student name, and the date on the lab title sheet on the main ee431 web page. Leave the grading information alone although make margin adjustments if needed so that it prints correctly on the right side of the page. I need that to be consistent from report to report to ease my efforts in grading numerous papers.

Keep in mind that throughout your engineering career, if you are doing any technical work at all, that you will be writing numerous reports similar to these labs. Your career tends to advance in association with your writing skill. Communication is important. If you cannot communicate then you are for the most part useless. So use these lab reports as an opportunity to develop the skill to clearly present something in a complete yet brief form.

The labs leave the procedure to you. Your job is to apply the general concepts as requested in the lab. This means you figure out how to perform the lab although strong hints will usually be provided. You must determine what data to collect and how to process it to meet the requirements of the lab. It is the job of engineers to figure things out. In life you will not be spoon-fed.

Your work is expected to be in a form that you would proudly hand in to your boss at work. In this case your boss is your instructor. You will be graded on presentation/neatness. Shoddy work equals shoddy score.

Grading: Grading is based on the following items. Part of your grade is objective and part is subjective – although I try to be as neutral as possible. If a lab has various yuck factors then it is going to receive a low overall score. If a lab makes a good impression and I can easily follow what you did and is complete then that lab is going to receive a high overall score. An ‘A’ lab does not have to be a literary masterpiece or have stunning color graphics. A “plain Jane” black and white presentation that meets all the requirements will earn an ‘A’ too. You are not graded on dazzle.

Completeness: Is it clear from your report that you did all that was required? If I am unconvinced then you will lose credit even if you did those items. A lab report should not leave the reader wondering what was done.

Calculations: Did you perform all the obvious calculations with your data? The point of a lab report is to analyze and that means taking data and doing appropriate calculations.

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The calculations should be shown to a level that it is clear how a result was obtained. You do not necessarily need every micro detail but you will lose points if I can not follow what you did. Basically, I need to see that you understand what you did. Blindly doing meaningless calculations will negatively impress me. Basically, could someone else replicate your experiment from your report?

Plots/data: Did you take all the needed data? Are your plots (should be done in Excel) formatted to clearly show what is going on. Just doing a plot that no one can understand does not count. I need to see meaning. The plot should use the correct scales – either linear or logarithmic (do not compute the log of your data for the plots – that will cost you – let Excel do the log plot for you). Use plots in the notes for the courses I teach as examples to follow. Circuit drawings also come under this – scanned hand drawings are fine if reasonably neat. It is OK to scan circuit drawings I provide with the lab. I well understand that time is a factor (it is for me too on many occasions) so I am fairly lenient on neatness/prettiness but do not push your luck.

Instructions: Did you follow the instructions for doing the lab and writing the report? If not then you will lose points.

Presentation: Is the report something you should be proud of or shamed of? Is the report generally neat? Can your instructor easily follow and understand what you did?