EE3204
Microelectronic Circuits II
D2015

Lab Information

Labs: W: 8:00am - 10:50am, AK227
W: 11:00am - 1:50pm, AK227

Lab Reports: Due at beginning of lab the following week.
Only one report per group necessary.

Late Policy: One lab report may be handed in up to one week late with no penalty. Beyond that, no credit.

The first lab will be on **Wednesday, March 25**.

Work in the lab may be in pairs or individually (no groups of 3 or more). Regardless of the arrangement in lab, **each person must have his/her own lab notebook and do the prelab individually in the notebook.**

Each person must be present in the lab and do the work to receive credit for the lab. Don't plan on skipping a lab, letting your partner do the work, and getting credit! This violates the course academic honesty policy.

Only one lab report per group is necessary.

Please be sure that your ECE mailbox number appears on the front of your report when you hand it in!

You should be able to finish the labs within the scheduled 3 hour time period. The circuits in the later labs are more complicated; to save lab time you are strongly encouraged to build the circuit on your breadboard before starting the lab.

LAB NOTEBOOK

Each person should have his/her own lab notebook. The best type of notebook is the bound kind with numbered pages, although spiral bound is acceptable. Looseleaf in a 3 ring binder is not acceptable! If you have a suitable notebook from a previous lab course, starting a new section for ECE3204 is OK. If the page numbers aren't printed in the notebook, number them as you go along. It's a good idea to use prominent headings to label the beginning of each new lab experiment, as well as the sections within each lab.

All entries should be made in ink. If you make a mistake, cross out - never erase or tear pages out of the notebook. Each page should be dated. Although the lab notebooks will not be handed at the end of the term, these are good habits to get into since (in the legal world) the lab notebook is an essential part of documenting the development of new ideas (e.g. for patent purposes).

The prelab should be done in your lab notebook. Completing the prelab is very important to using your time in the lab efficiently. Knowing what to expect from your lab measurements will allow you to catch mistakes before you have wasted a lot of time.

How much detail should be recorded in the lab notebook? There should be enough so that someone else can duplicate your experiment and verify your results. Show all essential calculations which are used to interpret measured data. Comment as necessary - you will need to return to the notebook later when doing the writeup, or perhaps for a later experiment.

Circuit diagrams should have component values (e.g. 100Ω), reference designations for each component (e.g. R_2), part numbers for diodes and active devices (e.g. 1N4148, LM741). Voltage and current signals should be clearly labeled with polarity indicated (-/+ for voltages, → for positive current).

Be sure to distinguish among directly measured values, indirectly measured values based on calculations made from measurements, and expected values from theoretical calculations (e.g. from the prelab). Important results can be indicated with a box or underline.

Describe any specifications of equipment or components that affect the accuracy of an experiment. For example, if the input impedance of the DMM or oscilloscope significantly loads the circuit being measured, the effect should be noted. Record the bench number at which you do the experiment - that way if something was wrong at the setup (e.g. a malfunctioning power supply) we'll be able to check.

Use lots of graphs and tables to organize and present information about experimental measurements and results. Even if you can't do a precise plot of results, it's very important to do a rough plot as you go along, as a sanity check of your results to make sure you're not making any huge mistakes in the lab. Make sure the axes are labeled with the signal or variable being measured, a numerical scale, and units (e.g., volts, seconds, etc.).

LAB REPORT

The lab report should be a concise report of the important results in the lab. It should be a complete record of your work in the lab: theoretical background, calculations and anticipated performance, empirical verification, and discussion of the results. While the report does not need to be as detailed as the lab notebook, it should "stand alone" - that is, it should be sufficiently self-contained so that it can be read and understood without reference to the lab handout.

The length of the writeup should be 5-10 pages (including figures and tables). There is no extra credit for long-winded reports, which rather than being impressive actually are far more likely to go unread and unappreciated.

As far as the level of technical discussion in the report: assume the reader has a background in electronics, but is unfamiliar with the particular topic in the lab. It is not necessary to re-derive results previously covered (for example, the gain of a simple op-amp circuit); however, the operation of newly introduced circuits should be covered both qualitatively and quantitatively.

As in the lab notebook, use as many figures as possible: circuit diagrams, waveform sketches, graphs and tables of measured results, visual comparisons of measured vs. predicted data. **Note that the scopes in AK227 can save screen shots to a memory stick using the front panel USB port**. Feel free to use screen shots of the oscilloscope waveforms to illustrate your measurements as appropriate.

Tip: Organize the lab writeup into sections based on the section numbers in the lab handout. This makes it easier for the TAs grading the writeup, as well as making it easier for you to be sure you've included all the material covered in the lab.

See the Sample Lab Writeup for an example of good practice in lab work documentation and writeup quality.