EE 462G: Electronic Circuits Lab
Laboratory Information and Policies

Lab Supplies

Student will have to purchase their own electronic components for the lab exercises. The list of parts is available on the course web site. You can purchase these parts anywhere and substitutions can be made as long as the parts are functionally the same and parameters are close. These parts are also sold at the IEEE parts store in Room 560 AH. Only one set of parts is required between lab partners.

For each lab, you can use flash drive to save the plots or even transfer the data to your Google drive or drop box account.

Laboratory Reports

- Each laboratory assignment is made up of two parts, the pre-lab (analysis and simulation) and corresponding lab exercise (build, measure, and interpret).
- New assignments will be posted on the course web page prior to your laboratory session.
- Lab reports are due at the beginning of the next laboratory section meeting.
- Late assignments will be accepted with a 10% penalty per day.
- You may work in groups up to 3 students in the laboratory (each group turns in a single lab report and data sheet).
- The report is graded on organization, completeness, clarity, presentation, and accuracy. Your report should look like a professional report.
- All lab reports must be prepared in a word processor and printed out.

Pre-Lab Assignments

- Pre-lab assignments typically involve an analysis of circuits used in the experiments so measured values can be predicted to some degree.
- This includes direct analytical work with the device models and circuit laws, as well as analysis with circuit simulation (SPICE).
- The pre-lab questions are included in the lab assignments.
- You will be given the solutions to the pre-lab assignments, and quizzes will be based on these assignments.
- **If you do not finish the lab experiment in the 3 hour time period, you will NOT be allowed extra time.**

Laboratory data sheet

- The data sheet must be handed in at the end of the lab session where the data was measured. Only one data sheet per group is required. Put the names of all group members on the sheet. Also make sure you have a copy to take with for preparing your report. It recommended that you use a standard laboratory notebook with carbon paper.
- The data sheet will be graded on neatness, completeness, and organization.
- A complete data sheet will have a sketch of the circuit and instrument hookup from which the data was taken (grounds should be clearly labeled), and if applicable, a table with circuit and/or instrument setting associated with measured values or a sketch of resulting waveforms.
- All entries on the datasheet must be hand written with the exception data collected with an automated system such as with a LabView program. In this case, the data file with multiple entries should be pasted into a word processing or spreadsheet program so labels and column headings can be added and the table printed out. The printout must be clearly labeled, associating it with the sketch of the circuit that generated it, and attached to the datasheet. (Don't forget to print a copy to take with you and save the data to a file on the floppy, memory stick, or network drive that you can access later.)
- All members of the group associated with the datasheet will receive the same grade.
- The data on the sheet handed in at the end of the lab exercise must match the data analyzed in the lab report.
- **All data must be collected in the allotted 3 hour lab period.** If you do not finish, you will lose points on the data sheet and lab report.

- This assignment primarily develops and assesses Course Outcome 2.

Final Lab

- The final lab will be a group presentation in the lab where each student should contribute to the building and measurement of the circuits.
- The requested circuits and measurements will be similar to what was done in previous laboratory assignments.
- The final lab will be given during the last week of class.
- The final lab grade depends on having the correct circuit, using the instruments properly, measuring values accuracy, and discussing issues related to the measurement.
- This assignment primarily assesses Course Outcome 2.

Lab Report Format

Lab reports must be prepared with a word processor and organized according to the following format.

- **Title Page**: This includes your name, lab partner's name, title of lab experiment, date of experiment, and date of completing the final write up.
- **Objectives**: Summarize the lab objectives.
- **Procedure Description:** Do not simply cut and paste sentences from the lab assignment text. Procedures must be described in your own words. Be succinct but complete. The reader should be able to repeat your results based on the description provided (without reference to the original assignment).
    - Each lab assignment will have multiple procedures and you need to describe each one.
    - For each procedure, start a new section with a descriptive title. You should always start out by stating what you want to demonstrate or measure. As a rule of technical writing, tell the reader what you want to accomplish with the procedure before going into details.
    - The experimental description includes the equipment, the circuits, their settings and connections. For all circuits show a figure with actual component values clearly labeled.
    - Label circuit nodes so probe/instrument connections can easily be described in the text.
    - Clearly indicate ground nodes associated with the instrumentation and power supplies.
    - Indicate what was measured (typically referred to as *dependent variables*), what was varied over the set of measurements (typically referred to as *independent variables*), and what was held constant during your experiment.
    - Give a title or label to each procedure so you can refer directly to it in the results section and discussion sections.
    - Start each procedure description with a new descriptive heading in your report. The "*how*" questions for obtaining the results are answered in this section. When grading this section the reader will ask the question, "Can I repeat these measurements from the information given?" If it is not clear (resulting from missing, poorly organized, or ambiguous information), then points will be lost.
    - This assignment primarily develops and assesses Course Outcome 4.
- **Presentation of Experimental Results:** After each procedure description, present the results.
    - A subheading must separate the procedure description from the presentation of results.
    - For each procedure efficient methods and statistics must be used for presenting the data. This may include tables, figures, mean values, standard deviation, error bars … All axes must be labeled as well as table columns and rows.
    - All figures and tables should be numbered and referred to in the text. Do not include a table or figure without introducing it within the text.
    - The actual data measured must be presented in this section along with any analysis (formula or description of code) used to estimate parameters or functions of direct measurements. The "*what*" questions concerning the measurements are answered in this section.
    - This component primarily develops and assesses Course Outcome 2.
- **Discussion of Results:** This section can vary significantly in length and analysis depending on the experiment. It typically includes a comparison of experimental results with the pre-lab predictions, a comparison between procedures, and/or a performance analysis of a circuit.

- There are discussion questions in the lab assignment to help direct your writing. Make sure you address these questions in your report, in addition to whatever other issues you, as an engineer, consider significant or important.
- The primary propose of this section is to interpret and explain the results. The "*why*" questions concerning the results are answered in this section.
- This assignment primarily develops and assesses Course Outcome 5.

- **Conclusions:** Summarize your results relative to the lab objectives. Assess how well the lab met the objectives. If applicable, suggest ways to improve the experiment, or how things could be done differently if experiment was repeated. This assignment primarily develops and assesses Course Outcome 5.

Lab Effort Plan

The first lab group activity is to determine how the work load should be divided up and agree on what is expected of each other. The main tasks are:

- Connecting up the components
- Making measurements,
- Recording data
- Maintaining the data sheet
- Completing the pre-lab assignment
- Organizing, writing, editing and proofreading the lab report.

For each lab clearly delineate responsibilities. Also schedule time outside of the lab and lecture meetings to work on the pre-lab and lab write-up. Since this is a 2 credit hour lab, 4-6 hours per week should be scheduled outside of class time to complete pre-lab and lab write-up assignments. A good lab plan lists the major components for each lab assignment, the person responsible, and the tentative time in the week that will be devoted to it over the whole semester. Make sure all 8 labs are covered by this plan, and adjust it as needed throughout the semester.