

Circuit Analysis Laboratory

School of Engineering
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Lab Assistants

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Overview

The experiments in this laboratory course are designed to cover the theoretical and analytical material in ENGR228 (Circuit Analysis). The main objective of the lab experiments is to *enhance your understanding of important analytical principles developed in the course by engaging you in the application of these principles in the laboratory*. You will be using lab equipment and software similar to that which is used in industry.

Each bench is equipped with a minimum of the following instrumentation which will be utilized to acquire and analyze electrical signals throughout the quarter:

- Breadboard;
- DC Power supply;
- Fluke bench-top multi-meter;
- Fluke hand-held multi-meter;
- Decade resistance box;
- Tektronix oscilloscope;
- Siglint function generator;
- PC with Microsoft Office;
- Laser printer.

Policies

Each lab session lasts three hours or less and will start promptly at the scheduled time. Everyone needs to finish the lab within the allotted time so please keep to task while lab is in session. Each person must turn in the completed pre-lab assignment *promptly* at the start of lab. The instructor or lab assistant will then give a brief introduction to the lab exercise. Below are some general policy guidelines:

- A. The pre-lab assignment includes reading the lab handout in advance and doing the pre-lab assignment specific to each lab experiment. All pre-lab assignments must be handed in at the beginning of lab to receive credit. No credit is given to late pre-lab handins.
- B. As part of the lab preparation, if required, you can use simulation software such as Multisim, Pspice, or LTSpice to simulate the actual experiments you will be doing in the lab and compare the results with those obtained at the bench.
- C. Students will work in groups of two or three in the laboratory. This encourages teamwork and makes the conduct of the experiments more efficient. You can collaborate on the pre-lab and on interpretation of the

measured data. However, each student is responsible for writing the pre-lab and completing the lab handout themselves. Copying of data from other groups or submitting artificial or altered information is prohibited and will result in a **zero grade for the course**, at the teacher's discretion. Filling in the lab report is an individual effort, in consultation with your lab mates and each student must turn in their own report.

- D. Each lab handin may be reviewed by the instructor or lab assistant for completeness before the student leaves the lab.
- E. The major instruments are permanently placed at the stations. Reusable components such as resistors, capacitors, and inductors must be selected from the component bins. These components can be reused and should be left on the table in the same manner as they were obtained (straighten the leads if necessary) or placed back in the bins.
- F. Leave your workplace at least as clean and tidy as you found it. Please put everything back in its proper place before leaving the lab.
- G. Be on time to the lab. The instructor or lab assistant will give a lab briefing at the start of lab. Timely attendance will be a factor in your lab grade.

Grading

Your lab work this quarter constitutes 25% of your total class grade and is comprised as follows:

- A. Each pre-lab hand-in (8 total) will be graded out of 10 points and will count for 48% of your lab grade.
- B. Each lab report (8 total) will be graded out of 10 points and count for 48% of your lab grade.
- C. Lab activity, coming to the lab on time, responsible handling of the lab experiments and equipment, paying attention to safety issues, and lab cleanliness will account for 4% of your lab grade.

Report Turn-In Policy

The lab and lab reports are designed to be completed within the standard lab time frame. The lab reports are due at the close of the lab session. Late lab reports will not be accepted unless arrangements are made with the instructor or lab assistant.

Lab Makeup Policy

All laboratory work must be completed during the designated lab period. Students who miss a lab session due to a documented emergency or illness are expected to complete the missed lab work during the makeup lab period currently scheduled for week 9 of the quarter.

Lab Schedule

NOTE: This schedule may change based on the professional judgment of the course instructor.

- Week 1 Brief lab meeting
- Week 2 DC Voltage, Current, Resistance, and Power Measurements
- Week 3 Node and Mesh Analysis
- Week 4 Thévenin and Norton Equivalents, Maximum Power Transfer
- Week 5 Resistive Attenuator Circuit Design
- Week 6 Phasors
- Week 7 First Order RC Circuit Response
- Week 8 Second Order RLC Circuit Response
- Week 9 Makeup lab
- Week 10 AC Measurements and Power Factor