

EELE 354 LAB ASSIGNMENT 1:
INTRODUCTION TO POWER AND ENERGY
LABORATORY

OBJECTIVES:

The objectives of this first laboratory are:

- To have students form the lab groups that they will work in for the remainder of the semester.
- To introduce students to the laboratory safety regulations and procedures utilized in the laboratory.
- To have students begin becoming familiar with the laboratory testing and measurement equipment.

FORMING LAB GROUPS:

In this first laboratory session, students will form teams of at most three. Upon entering the lab, form your lab group from amongst the students in your lab section. If you are unable to find a full (three member) team, the laboratory TA will help group you into a team. Once you have formed your group, select one of the lab benches for performing the work required during this lab. **Do not connect or turn on any equipment until given permission by the lab TA.**

Except in extenuating circumstances, the groups that are formed on the first day of lab will work together for the remainder of the semester. If there is a problem with the group, please see the laboratory TA or contact the course instructor.

LABORATORY SAFETY:

In this laboratory you will work with 110/208/220 V electricity. For your own safety, as well as that of the other group members, TA and instructor, you need to take some necessary precaution in your work. First, make sure your circuit connections are solid so that the terminals of wires in your circuit won't become loose. Always have your lab instructor check your circuit before energizing it; otherwise, you will lose credit for the lab experiment you are doing.

ADDITIONAL PRECAUTIONS:

No drinks in the laboratory: The electrical equipment in the laboratory is very expensive. Spilling liquids on this equipment can significantly damage the testing and measurement equipment. Additionally, spilled liquids can create new conduction paths

for electricity to short out your circuit and damaging equipment without the liquid actually touching it. Lastly, the wet human body exhibits a much smaller resistance to electric current than the dry human body. That is, a larger current will pass through you if you are wet than if you are dry. Since it is this **magnitude of electric current** that determines the severity of an electric shock, it is important that we don't have spilled liquids making bad situations worse in the event of an accidental electric shock.

Emergency circuit breakers: There are two **RED** emergency circuit breakers in the laboratory. These breakers must be pressed **only** in case of an emergency. When pressed, all the work benches will go without power. Your TA will explain the role of these breakers and the safety measures you need to follow in the laboratory.

Emergency help: For any emergency, dial 911 and the university police will respond. This should be done under the direction of your TA or class instructor.

There have not been any accidents in this laboratory since it was built. Let's keep it that way by having a safe and productive semester of laboratory experiments!

STUDENT RESPONSIBILITIES:

Students are expected to be on time for their laboratory session and well prepared for the lab. This includes the group completion of any pre-lab assignment prior to entering lab. Students are expected to remain in the laboratory until they have finished their data analysis. Students are *encouraged* to also complete their group lab report during the lab session. The experiments that will be performed in the lab are designed so that, in most cases, team members will have enough time to complete the work, analyze the data, and complete the lab report within the two-hour lab period. However, to be able to do so, it is important that students come prepared for the laboratory with the pre-lab assignment completed and the entire lab assignment read and understood.

Laboratory Report Format:

The lab assignment sheets will contain spacing for answers to laboratory questions. As such, the group lab report can simply consist of the printed lab assignment sheet with **complete yet concise and neatly printed** written answers in the spaces provided. If more space is required to answer the questions, the student should attach an addendum sheet of paper with the completed answer(s) to the assignment sheet.

If your lab reports are repeatedly illegible, your laboratory TA reserves the right to enforce you to type your answers on a computer.

Laboratory Notebook: It is up to the student to determine if they would like to have a dedicated bounded notebook or a dedicated section of a binder to serve as their laboratory notebook. In either case however, the student must keep a clean notebook or binder section for recording data and performing calculations. The lab TA may check for the recorded data or calculations as part of the laboratory participation grade, even if the lab report does not require including this information. Additionally, it is in the students' best interest to maintain a well organized notebook or binder section along with copies of all lab reports as information from labs may be included in class examinations.

EXPERIMENT #1: WORKING WITH THE MEASURING INSTRUMENTS:

In this laboratory session, after dividing into teams, you will become acquainted with the measuring instruments on your workbench (e.g. power analyzer, multimeter, oscilloscope) and their operation. You will make note of the DC and AC voltage levels available in the laboratory and the different components you will be working with in the lab throughout the semester. You will need to record in your notebook the ratings of the electric machines at your station (from their name plate rating) for future reference. There is no report required for this lab session!