Lab 1: Introduction to Laboratory Equipment
ReadMeFirst

Lab Summary

This is the introduction to laboratory equipment and cables. The equipment covered includes the oscilloscope, function generator, power supply, and digital multi-meter. This is NOT a virtual laboratory. Please attend your regularly scheduled lab session to perform this lab.

On the lab website, there are videos for each lab. The "Screencast" video contains a video PowerPoint presentation that includes all of the background material that you will need for the current lab. The "Demonstration" video demonstrates how to perform the lab.

Prior to attending lab, you need to watch the two videos listed under "Introduction to Laboratory Equipment" and listed in the Lab Preparation section of this document. Once you have completed watching the videos, complete the "Introduction to Laboratory Equipment" Quiz on Canvas. You also need to watch the "Cable Damage" video. When you attend the lab in-person, you need to perform the procedures listed for this lab. You may rewatch the videos alongside performing the labs in-person as well.

Lab Preparation

Please watch the following video and screencast in preparation for the lab. Links to the videos are found on the https://u.osu.edu/ece2300labs website, under LABORATORIES and Lab 1.

You can also log-in to the laboratory computer to access the Lab website.

Computer Login: Each student has a temporary ECE computer account for the duration of the course.To log in to

the laboratory computer, your username and default password are as follows:

USERNAME: [last name] [.] [dot number]

(Do not include the brackets)

The password is the same password you use for your OSU account/email

Once you are logged in, there should be an ECE 2300 link on your desktop. Clicking on the link takes you directly to the course website: u.osu.edu/ece2300labs

Videos:

- ***Cable Damage***
- ***Introduction to the Lab Equipment***

Screencast:

- ***Introduction to Signal Terminology***

Procedure

Part 1:

Obtain the Lab 1 resistor from the laboratory staff. These should be available at the main lab desk.

1. Use the Digital Multi-meter to measure the resistance value and record this on the Lab 1 Result Sheet.

Part 2:

Use the 0.01 µF (10 nF) capacitor (103) from your lab kit.

1. Use the Digital Multi-meter to measure the capacitance value and record this on the Lab 1 Result Sheet.

Similar to measuring resistance on a resistor, to measure capacitance, connect each lead of the capacitor to the positive (red) and negative (black) terminal on the multi-meter. Since the capacitors we're providing are non-polarized, you can connect any lead to any terminal. Turn the knob to the diode/capacitance setting (Fig. 1.), then press the yellow function button located at the top-right of the multi-meter (located to the right of the "RANGE" button)

Figure 1. Diode/Capacitance Setting

Part 3:

Use the clear LED from your lab kit.

1. Use the Digital Multimeter in the Diode setting to test the LED. The LED must light up.
2. Does the positive (red) connection go to the long lead or short lead? Record your answer in the results sheet.
3. Record the color of the LED that you tested.

Part 4:

Watch the **"Cable Damage"** video.

Checkpoint 1: Demonstrate the proper way of connecting the BNC cable to the oscilloscope.

Part 5:

1. Using the function generator, produce a signal on the oscilloscope with the following settings, **Frequency**: 3 KHz**, Amplitude**: 2 $V_{p\text{-}p}$ (Volts peak-to-peak)**, Waveform type**: Square

Checkpoint 2: Show your signal to a lab monitor or TA.

It is your responsibility to leave the lab bench in the state you found it at the start of the lab. Remember others will be using that bench after you! After finishing a lab, make sure that the lab bench is clean and in good shape. After making sure the lab bench is clean and all the equipment are put away, you will receive your final clean-up checkpoint. The TA or monitor will inspect your work bench and sign her/his initials on a form placed on the T.A. desk. You will lose points if you fail to have your desk inspected at the end of the experiment. This process constitutes your final clean-up checkpoint.

Checkpoint 3: Clean up and show your workbench to the lab monitor or TA.

DO NOT FORGET to turn in your Result Sheet with Your Lab Group number and the names of all of your team members that were in attendance today.