Lab 1 Electronics Basics

Hand in your attempt of Homework 1 to your professor.

Digital Multimeter (DMM), Resistor and Resistor network

1. Use a DMM to measure the resistances of 3 different resistors (small, medium and large) and see how well they match their specified values. Are they within specifications based on their tolerance bands? Using a DMM to measure the voltage of a 9V battery. Does it change with time? Record the data on your lab book. Set the 3 resistors aside. We will use them later.
2. Review the use of our breadboard and the on-board power supplies. Consult with the professor or your TA before your group move to the next exercise.
3. Build the resistor network you designed in *Homework 1 Problem i-b* with *Multisim* on the breadboard. Measure the total resistance with a DMM. Does the total resistance agree with your calculation and simulation? Apply 10 V to your breadboard circuit and measure the total current drawn in the circuit and calculate the resistance. Does this calculated resistance agree with what you read on the DMM?

Voltage Divider

1. Build the voltage divider you designed in *Homework 1 Problem ii-b* with *Multisim on the breadboard*. Pick any resistors R_1 and R_2 we have and vary the input voltages from 3 V to 15 V in your breadboard circuits so you can get 4 output voltages: 1.5V, 3.3V, 5V and 12V. Draw the 4 circuits schematics on your lab book with a pencil.
2. Build the voltage divider you designed in *Homework 1 Problem iii* with *Multisim*. Measure the output voltages of the 3 different load resistance (the three you measured in the beginning). Compare your results. Do the results make sense? Record all the data.

Learn to Use an Oscilloscope

1. Learn to boot and perform some basic tests of the oscilloscope. Consult with the professor or your TA to generate some random waves (sine, square, triangle or sawtooth) on the screen and figure out how to save the wave (screenshot) to your own USB flash drive. Transfer your saved waveforms to your laptop, print it out, trim the paper and tape it to your lab book.

Lab Book Guideline

Read this guideline carefully on our Blackboard.