ENG 142-E1   **Fundamental Engineering Design**   **Prof Jesson**

Lab # 2: Ohm's Law

This lab is to give you the essential of Ohm's Law. Ohm's law states that the voltage v across a resistor is directly proportional to the current i flowing though the resistor or $v = iR$.
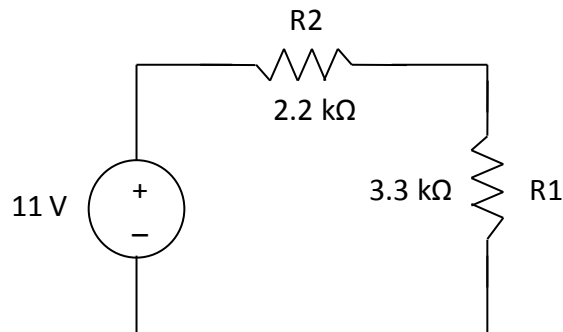

Figure 1. Circuit Diagram

Prelab: Using Figure 1, create a table as shown in below (Table 1) in the lab notebook. Calculate the voltage across the resistors and the current for the circuit. Show your calculations and fill out the results in the table.

Table 1. Color Schemes, Voltages and Currents of Resisters

	Color scheme	Voltage **V**	Current **i**
R1	orange,orange,red,gold	4.4v	2ma
R2	red,gold,red,red,red	6.6v	2ma

Lab:

1. Identify and find the components of the circuit.
2. Create a table as shown in below (Table 2) in your lab notebook.

Table 2. Measurements

	Measurements		
	Resistance **R**	Voltage **V**	Current **i**
R1	2.1989ohms	4.394	2.005 ma
R2	3.3063	6.629	2.005 ma

3. Before wiring, measure the resistance of R1 and R2 using the multimeter. Write your measurements in the table.
4. Wire the circuit using wires, the breadboard, and the power supply provided.
5. Measure the voltage across the resisters R1 and R2. Write your measurements.
6. Measure the current (**i**) flowing through the circuit. Write your measurements.
7. What is the purpose of the R1?
8. Find the percent differences between your experimentally determined resistances in step 3 and the measured resistance values in step 5.

$$\Delta = \frac{\left|R_{meas} - R_{exp}\right|}{R_{exp}} \times 100\%$$

9. Using PSpice, construct the circuit with Schematics and simulate it. Save the file as Lab 2.   Capture screen images of PSpice and prototype breadboard circuit
10. Include the simulated circuit diagram and the results from the output file in your lab report (import the diagram using "Print Screen" and do not attach them).
11. Compare and discuss the values in the prelab, the actual measurements, and simulated in your report.
12. Attach this instruction paper at the end of your lab report.

Your Name: _____

Lab Date: _____   Check by: _____

Lab Partner(s): _____