



Introduction to Safety – Unit Five: Electrical Safety

Lab Exercise 2: Using Multimeters Safely

Student Name: _____

Materials Needed:

- Power Supply 5vDC
- Breadboard
- Wises
- 1KΩ Resistor

Description of Topic

- When working with electrical circuits, it is sometimes necessary to find out how much voltage is applied, and the amount of current that is flowing through the conductors. The instrument primarily used by technicians and electrician to find out what these circuit values are is the multimeter. When used properly, these measurements are safe and will not cause an injury. However, if the measurement procedure is done improperly, it is possible that the operator will receive an electrical shock.
- In this laboratory exercise, you will be required to make a current measurement and a voltage measurement by using the proper techniques and procedures. These procedures will be observed by an instructor as you take the readings.

Objective

- The student will safely measure voltage and current of a live circuit using a multimeter.

Safety and Multimeter Usage

- After attending a lecture or completing the reading assignment that provides instruction on how to use a multimeter, you will be required to demonstrate measuring current and voltage in a live circuit.
 - You will be required to assemble the circuit from a schematic diagram.
 - The proper circuit assembly.
 - Using the one-hand rule.
 - When the circuit is live, you will be graded on the meter lead placement (including properly polarity), measuring voltage, and measuring current.

<https://www.wisc-online.com/learn/career-clusters/stem/dce4002/voltmeter-circuit-connections>
<https://www.wisc-online.com/learn/career-clusters/stem/dce3902/ammeter-circuit-connections>





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Lab A

- Assemble the following circuit and apply power.
- Ask the instructor to observe you when conducting the following steps of this exercise.

Instructor Check for proper circuit assembly: _____

- Measure the voltage.

Instructor Check _____

- Measure the circuit.

Instructor Check _____

- Using the one-hand rule.

Instructor Check _____

- Disassemble the circuit and return the parts and equipment to their proper storage location.

Instructor Check _____



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Grading Rubric

Below is an example of a rubric to implement when evaluating the performance of individual students for each of the laboratory exercises.

	Excellent 5 pts	Good 4 pts	Fair 3 pts	Poor 2 pts	Unacceptable 1 pts	Grade Received (N/A)
Ability to Follow Directions	Excellent Followed directions to the letter.	Good Followed directions.	Fair Moderately followed directions.	Poor Did not follow directions.	Unacceptable Did not appear concerned with directions.	Grade Received
Demonstrate Knowledge of Tools	Excellent Student knows and is able to identify and explain necessary tools for completion of the project.	Good Student is able to identify and explain necessary tools for completion of the project with some assistance.	Fair Student is unable to identify or use tools without major prompting.	Poor Student is not able to both identify and use tools.	Unacceptable Student's use of tools posed a danger to self and others.	Grade Received
Level of Needed Assistance	Excellent Student was able to complete the task without assistance.	Good Student was able to complete the task with little assistance.	Fair Student was able to complete the task with moderate assistance.	Poor Student was unable to complete task without major assistance.	Unacceptable Student was unable to complete task with assistance.	Grade Received





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	Excellent 5 pts	Good 4 pts	Fair 3 pts	Poor 2 pts	Unacceptable 1 pts	Grade Received (N/A)
Student Preparedness	Excellent Student had/gathered all materials and was completely ready to go to work.	Good Student had/gathered most materials and went to work.	Fair Student had/gathered most materials, however, they needed excess time to do so.	Poor Student did not have/gather some of the needed materials to perform work.	Unacceptable Student did not have/gather the needed materials and was unable to perform work.	Grade Received
Time Management	Excellent Routinely used time well throughout the project to get the job done on time.	Good Used time fairly well throughout the project.	Fair Procrastinated somewhat but did get the job done on time.	Poor Was unable to adequately meet timeline due to inability.	Unacceptable Did not meet timeline due to procrastination or wasting time.	Grade Received





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