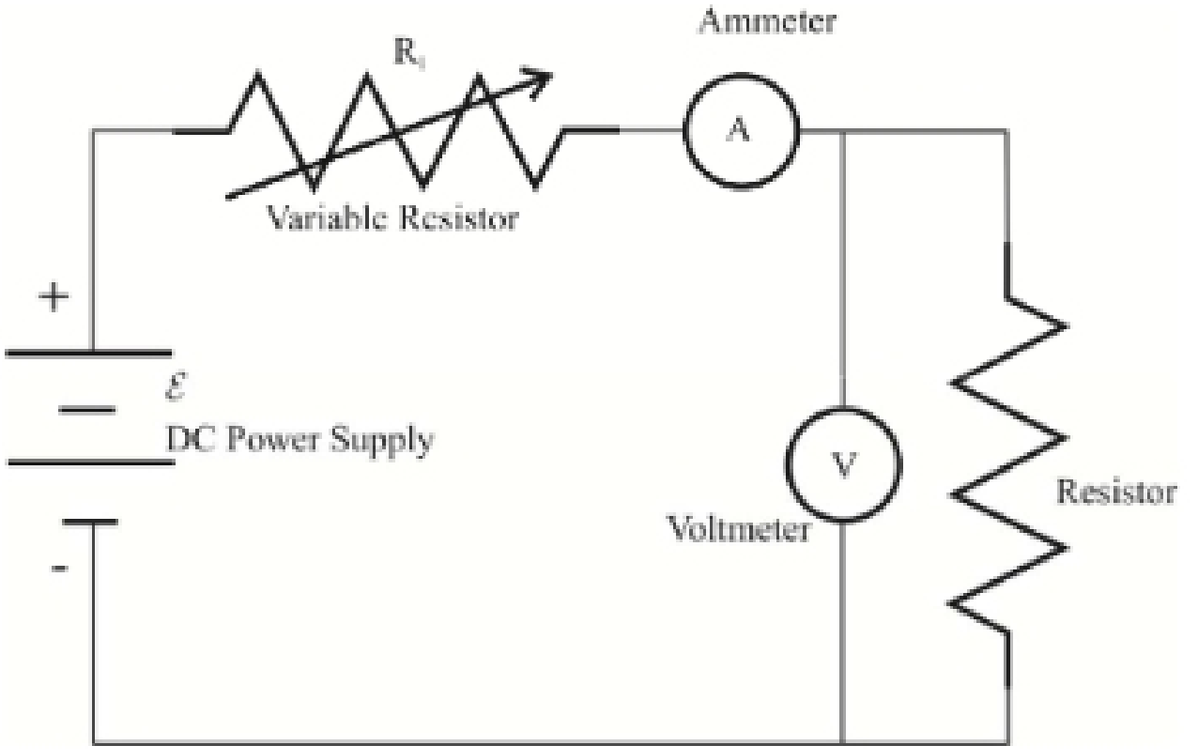
Experiment EC1: DC Circuits

In this experiment you will accomplish the following tasks:

1) Determine the resistance of resistors by using Ohm's law after measuring voltage and current.
2) Determine the resistance of an Ohmic conductor (resistor) by a least square fit of voltage and current data.
3) Measure voltage and current for a non-Ohmic conductor (silicon diode).
4) Determine the resistance of resistors wired in series.
5) Determine the resistance of resistors wired in parallel

V-1



Assemble the circuit shown above. The DMM is used to measure voltage. Set R_1 to 30 Ω. For each resistor do the following:

Set current I between about 0.01 and 0.04 Amperes.
Record I and σ_I, voltage V and σ_V.

Disconnect the unknown resistor and the DMM from the circuit.
Measure the resistance using the DMM.

SectionVI-1 of the report

Resistance R is defined as: $R = \frac{V}{I}$

Tabulate the data from V-1. σ_I is determined as it was in EC0, σ_V is $\pm$ the last digit (least count) of the DMM.

Using I , σ_I, V and σ_V. determine and report $R \pm \sigma_R$ for all four unknown resistors. Compare these to the values of R as measured by the DMM. Do the values agree?