

## **Lab 4: Resistivity of Nickel Chromium Wire and Use of the Wheatstone Bridge Circuit**

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## 1 Purpose

In this lab, we measured the resistance of a nickel chromium wire and calculated the resistivity  $\rho$ . We then built a Wheatstone bridge to find the resistances of individual capacitors.

## 2 Theory

Using nickel chromium wire (80% *Ni* – 20% *Cr*), we will apply the equations for calculating resistivity  $\rho$ .

For a given wire resistivity  $\rho$ , length  $L$ , and cross-sectional area  $A$ , the resistance  $R$ , is given by:

$$R = \frac{\rho L}{A}$$

Solving for  $\rho$ , the above equation is re-written as:

$$\rho = \frac{RA}{L}$$

Verifying the units for  $\rho$ :

$$\rho = \frac{\Omega m^2}{m} = \Omega m$$

## 3 Experiment Analysis

## 4 Procedure

## 5 Data and Graphs

### 5.1 Part 1

### 5.2 Part 2

### 5.3 Part 3

## 6 Results

## 7 Questions

### 7.1 Part 1

### 7.2 Part 2

### 7.3 Part 3

### 7.4 Part 4

## 8 Conclusion