Lab Group		***Students who hand in the report***	***Control Stamp***
Session Date			
Deadline Date			

MAGNETIC FORCES

Note:

- ***Include in the tables all units and uncertainties of the measurements.***
- **The straight lines of the least squares fit should be drawn in the same plot as the experimental points.**

5.2 Dependence of the magnetic force with the current.

Measurement of m_0

Current I	m_0 measurement #1	m_0 measurement #2	Mean value of m_0
0 A			

Measurement of m_I

Current I	m_I measurement #1	m_I measurement #2	Mean value of m_I

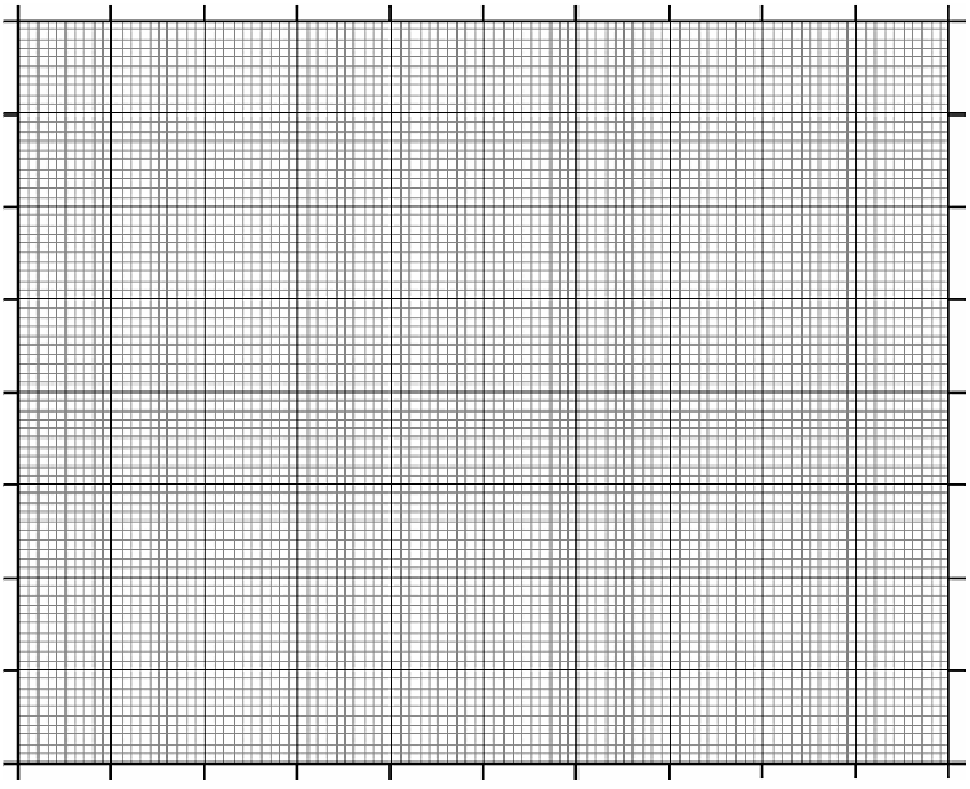
Calculation of F_m

Current I	F_m

Expression used to calculate the uncertainty of F_m

ΔF_m =

Plot: F_m - I



- **Least-squares fit of y = F_m with respect to x = I.**

$$\sum x_i =$$
$$\sum y_i =$$
$$\sum x_i y_i =$$
$$\sum x_i^2 =$$
$$n =$$
$$\sigma =$$

- **Results of the least squares fit:**

  - Slope.

m = Δm =

m = ± ( )

  - Intercept.

b = Δb =

b = ± ( )

- **Interpretation of the values of the fit parameters obtained from the least squares fit of the experimental data using equation [2].**

• **Get the value of B inside the magnet from the fit parameters obtained**

Expression used to calculate F_m and its uncertainty.

$$B =$$

$$\Delta B =$$

Final numerical results

B = ± ( )

5.3 Dependence of the magnetic force with the length of the conductor.

Measurement of m_I

Length (m)	m_I measurement #1	m_I measurement #2	Mean value of m_I
0.01			
0.02			
0.03			
0.04			
0.06			
0.08			

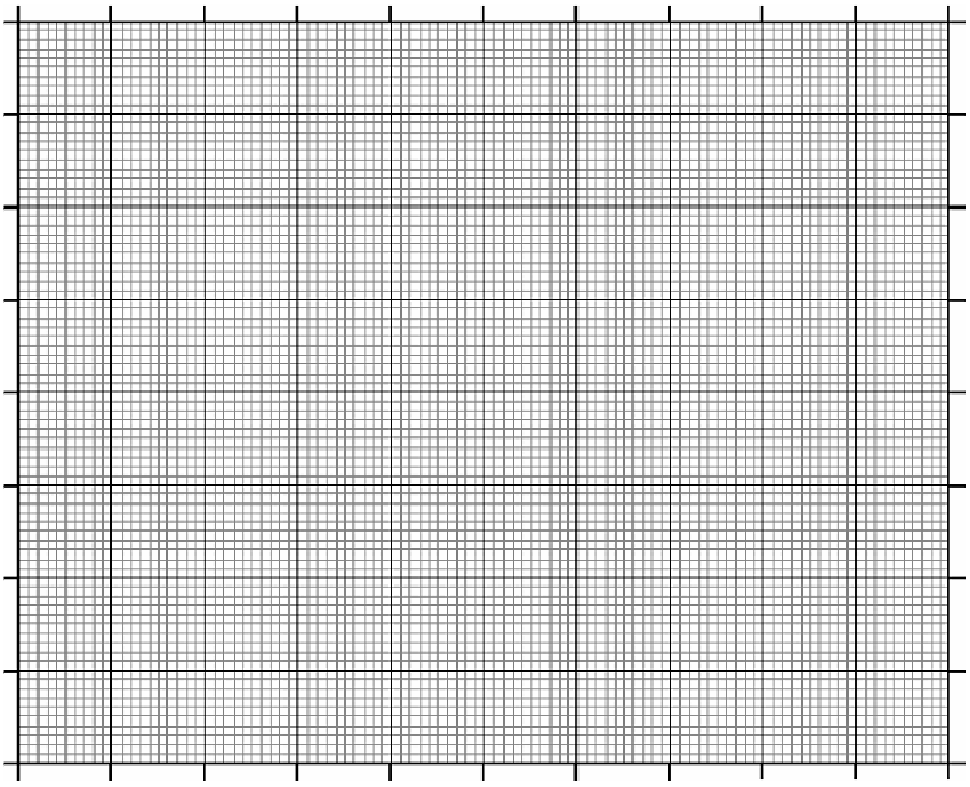
Calculation of F_m

Length (m)	F_m
0.01	
0.02	
0.03	
0.04	
0.06	
0.08	

Expression used to calculate the uncertainty of F_m

ΔF_m =

Plot: F_m - L



- **Least-squares fit of y = F_m with respect to x = L.**

$$\sum x_i =$$
$$\sum y_i =$$
$$\sum x_i y_i =$$
$$\sum x_i^2 =$$
$$n =$$
$$\sigma =$$

- **Results of the least squares fit:**

  - Slope.

$m =$ $\Delta m =$

$m =$ $\pm$ ( )

  - Intercept.

$b =$ $\Delta b =$

$b =$ $\pm$ ( )

• Interpretation of the values of the fit parameters obtained by performing a least squares fit of the experimental data using equation [2].

• Get the value of B inside the magnet from the fit parameters obtained

Expression used to calculate F_m and its uncertainty.

$B =$

$\Delta B =$

Final numerical results

$B =$ $\pm$ ( )

Questions.

• Compare the values of B obtained in parts 5.2 and 5.3. Are the results consistent with each other?