EXPERIMENT 2: PLOTTING AND ANALYZING LINEAR GRAPH

Course Learning Outcome:
Demonstrate manipulative skills during experiments in measurement and uncertainty, plotting and analyzing linear graph, free fall, linear momentum, friction and thermal conduction in laboratory. (P3, CLO2, PLO 2, MQF LOD 2)

Learning Outcomes:
At the end of this lesson, students should be able to develop skill in plotting and analyzing linear graphs.

Student Learning Time:

Face-to-face	Non face-to-face
1 hour	1 hour

Instruction: Read over the lab manual and then answer the following questions.

Introduction:

1. Write linear graph equation and defined the symbol.

Symbol	Linear graph equation :
m	
c	

2. Write equation to determine gradient from the graph.

$$= \frac{y_2 \quad y_1}{x_2 \quad x_1}$$

3. Determine the quantity for x-axis and y-axis in each following statement.

No.	Statement	x - axis	y - axis
1.	Plot a graph of force, F against x.		
2.	Plot a graph of depression, D against m.		
3.	Plot a graph of mass load, M against extension, e.		

***Note**

When plotting the graph, it always y - axis **AGAINST** x - axis

4. Solve the problem for each **Case**:

Case 1

A student has conducted an experiment on a metal conductor which obeys the Ohm's Law when current, I, passing through a metal conductor is proportional to the potential difference, V, across the conductor; $V = IR$ where R is the resistance of the conductor.

$V(\pm 0.05\,\text{V})$ $(y-\text{axis})$	0.25	0.35	0.60	0.80	1.00	1.15	1.45	1.60
$I(\pm 0.05\,\text{A})$ $(x-\text{axis})$	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80

A graph of potential difference, V, against current, I is plotted.

(a) Calculation of centroid.

$\bar{x} =$

$\bar{y} =$

(b) (i) Gradient, $m =$

(ii) $y-$ intercept, $c =$

Case 2

In an experiment, a stone is released repeatedly from the top of a tall building of height, H. The time, t, taken for the stone to reach different height, y, above the ground.

The relationship between H and y is given by equation $H = y + \frac{1}{2}gt^2$ where g is the acceleration due to gravity.

$y(\text{m})$	5	10	15	20	25	30	35
$t^2(\text{s}^2)$	12.18	11.22	10.18	9.12	8.18	7.13	6.10

A graph of y against t^2 is plotted.

(a) Calculation of centroid.

$\bar{x} =$

$\bar{y} =$

(b) (i) Gradient, $m =$

(ii) $y-$ intercept, $c =$