

Standard Operating Procedure (SOP)

Engineering Physics 25PY101

Laboratory

Section 24

Course Instructor: Dr. Sreekar Guddeti

Don'ts and Dos

Don'ts

- Do not bring any kind of food or beverages into the laboratory.
- Without a proper dress code and a student ID card, nobody is allowed into the lab.
- Do not bring/use your mobile phone into the laboratory, if anybody is found, serious punishment will be accorded.
- Do not touch any equipment/apparatus, electrical circuits or switch boards without the knowledge of the instructor/lab technicians.
- Unauthorized experiments and indiscipline behavior are not allowed in the laboratory.

Dos

- Always be on time at the start of the lab with proper dress code and student ID.
- Be regular in the laboratory practice, as repetition of the lab is not possible.
- Keep the environment clean.
- Always carry your laboratory accessories like pencil, graph, scale, calculator, manual, observation, and final lab reports.
- Inform the instructor if there is any problem while experimenting.
- After finishing the experiment, turn off all the electrical components and handover to the lab technicians. Any breakage of the components will lead to a penalty.
- Always follow the safety measures, keep yourself at a safe distance from high-power transmission lines. If any difficulty, please bring it to the notice of the instructor or lab technicians.
- After completion of data collection, complete the calculation in all aspects and make sure that you get a signature from the instructor.

Mandatory resources

- Record papers
- Graph papers

- **(Non programmable) scientific calculator**
- Stationery

Borrowing and lending of resources is not allowed.

Continuous Lab Assessment

Engineering Physics Laboratory Continuous Lab Assessment (CLA)																							
Department of Physics <table border="1"> <thead> <tr> <th>S.No.</th> <th>Component</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>A report of about 1 page on the proposed experimental layout and background theory before the start of the lab session</td> <td>2</td> </tr> <tr> <td>2.</td> <td>Viva and Interaction to evaluate understanding of the concepts</td> <td>4</td> </tr> <tr> <td>3.</td> <td>Experimentation and Data Collection</td> <td>4</td> </tr> <tr> <td>4.</td> <td>Analysis of Experimental data and Interpretation</td> <td>5</td> </tr> <tr> <td>5.</td> <td>Finalized report submitted in the next week</td> <td>5</td> </tr> <tr> <td></td> <td>Total</td> <td>20</td> </tr> </tbody> </table>			S.No.	Component	Marks	1.	A report of about 1 page on the proposed experimental layout and background theory before the start of the lab session	2	2.	Viva and Interaction to evaluate understanding of the concepts	4	3.	Experimentation and Data Collection	4	4.	Analysis of Experimental data and Interpretation	5	5.	Finalized report submitted in the next week	5		Total	20
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School of Applied Sciences & Humanities																							

Continuous Lab Assessment (Formative)

One-page report

Before the lab session, student needs to study about the experiment and summarize his/her understanding in two sides of a single page, also called one-page report. The summary may include

- Aim
- Apparatus
- Brief description of theory in not more than six sentences written in own words
- Working formulae
- **Precautions**
- Applications

Viva Voce

After performing the practice, at least four questions will be asked by the instructor who taught the practice.

Experimentation and Data collection

While performing the practice, **student needs to be alert as there is risk to life** while dealing with instruments.

Data collection

Data tables need to be filled in the manual. After data collection, please take the approval of faculty/co-faculty to proceed with graphing in the form of signature.

Graphing

Model graph

Use the model graph as a guide to plot the graph.

Title

Title is mandatory. Additionally, any specific conditions used should be mentioned. For example, in Hall effect practice, there are two graphs, one with and the other without magnetic field.

Axes

Draw the axes 2 blocks (each block is 1 cm x 1 cm) inside the border to avoid cluttering of labels and burying of text inside punched area.

Labels and Scales

Every graph needs to have a minimum of three things --

- X axis label
 - Name of Quantity
 - Symbol of Quantity
 - Unit of Quantity
- Y axis label
 - Name of Quantity
 - Symbol of Quantity
 - Unit of Quantity
- Scales
 - Scale-X: 1 cm = ... [X-axis: Unit of Quantity]
 - Scale-Y: 1 cm = ... [Y-axis: Unit of Quantity]

Scale should be chosen in such a way that maximum area of the graph is utilized.

Data

Use clean markers for marking data. **Avoid difficult to view markers like \cdot .** Instead use \odot , \otimes , \oplus . Avoid asymmetric markers like Δ , ε .

Fit

There are two types of fit the observed data—

1. Linear
2. Non-linear

For linear fit, draw a straight line by eye-estimation in such a way that the data points are equally spread on both sides of the fit. The fit need not pass through any of the data points.

Similarly, for the non-linear, draw a smooth curve by eye-estimation in such a way that the data points are equally spread on both sides of the fit. The fit need not pass through any of the data points.

In both the cases, do not join the data points with line segments.

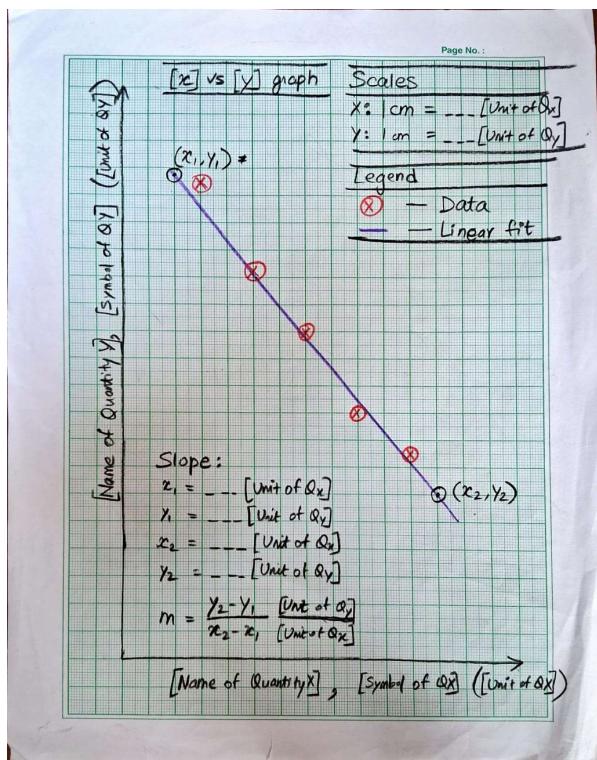
Slope estimation

For the linear fit, choose two points on the lines and estimate the slope using the slope formula. The estimation needs to be recorded on the graph paper.

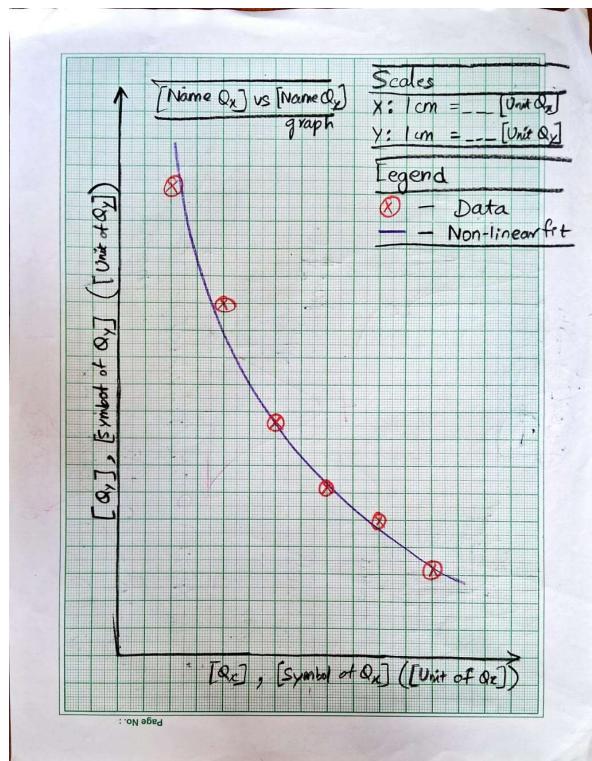
For the non-linear fit, extract the relevant information specific to the practice.

Legend (optional)

Write the legend as per the type of graph.



Graph of linear Data



Graph of non-linear data

Analysis of Experimental Data and Calculations

Slopes of linear graphs need to be written on the graph, calculations related to tabular data need to be written in

- manual, and
- record (on white side)

Finalized report submitted in next week

The set of lab papers for a given practice is called a **record**. Each lab paper needs to be numbered and registration number needs to be written.

In addition to the 1-page report, the final record must contain the following on the border side --

1. Aim
2. Apparatus
3. Working formula
4. Formula
5. Results

and the following on the white side --

1. Circuit/Ray diagram
2. Model graph
3. Tabular data
4. Calculations

Note: Results is the final section and there needs to be vertical space of at least 3 inch after the Results section to put stamp of Continuous Lab Assessment (CLA).

Record is expected to be submitted within a week of performing the experiment.
Delay will incur penalty of -1 for every additional week.

Once the record is filed in the record book, fill the entry for the practice in the index page with the starting page number and signature of the faculty who did the evaluation.

Summative Assessment

Engineering Physics Laboratory Summative Assessment				
Department of Physics				
S.No.	Component	Examiner 1	Examiner 2	Total Marks
1.	Objective and Procedure	4	4	8
2.	Experimentation and data collection	4	4	8
3.	Computation of Results	4	4	8
4.	Analysis of results and interpretation	4	4	8
5.	Viva Voce	0	8	8
Total		16	24	40

School of **Applied Sciences & Humanities**

Summative Lab Assessment

END of SOP