



**PHY 220**

**PHYSICS  
LABORATORY 1**

**Course Guide**

**COURSE  
GUIDE****PHY 220  
PHYSICS LABORATORY I****Course Adapters**

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## Introduction

"When you can measure what you are speaking about and express it in numbers, you know something about it; when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind."

- Lord Kelvin

Scientific truths are based on experimental observations. Scientific knowledge is not perfect and complete without experimentation. So to be acquainted with science, its truth and conclusions are to be verified by actual experiments in a laboratory.

## Course Objectives

The objectives of this Physics Laboratory Course are to enable you to

- (a) gain experience in the scientific method and learn the process of scientific enquiry which includes taking unbiased observation; interpreting and analysing data and deriving conclusions,
- (b) acquire basic skills and confidence in handling instruments and materials as well as the ability to overcome difficulty when an experimental arrangement does not work, and
- (c) develop scientific attitudes and interests viz. curiosity, not accepting anything at face value, questioning, ascertaining and then accepting.

Physics Laboratory I envisages two types of experiments: (a) preset experiments and (b) investigatory or open-ended experiments. In preset experiments emphasis is on measurement of physical quantities on a set pattern while in open-ended experiments, different students can try different approaches.

## Study Guide

You are expected to go through all the write-ups before coming for laboratory work. For successful completion of an experiment, you should master skills of making measurements with a given instrument, analyse data, learn to make error analysis, and quote results with correct number of significant figures. For this purpose you are expected to master the units on 'Measurement' and 'Error analysis'.

In particular, you should be very clear about the use of graph paper in a physics experiment. In these experiments, you will use linear as well as semi-log and log graphpapers. In these units we have given some Self Assessment Exercises (SAEs). By answering these questions yourself,

you will grasp the ideas better. If you are stuck up with any **SAE**, you may look up the solution given at the end.

Before performing an experiment, you should familiarise yourself with the apparatus you are likely to use in the laboratory.

When you go to the laboratory to perform an experiment, you should have a clear idea as to what you have to do and how you are to do it. You are advised to read each write-up carefully. If you wish to go deeper into some aspects, you should refer to other books on physics practical available in the library at your study centre. If feasible, some part(s) of an experiment may be tried out at your home. You are expected to record your observations and draw your inferences. These may be verified after performing that particular experiment in the laboratory.

On an average, you will work for about six hours in the laboratory for each experiment. While working in the laboratory, if an experimental arrangement is not working, you should try again. If you still fail, consult your facilitator. We hope that everyone will complete the work in this time. As far as possible, you should work independently since your laboratory work will be continuously evaluated by your facilitator. You must complete your work everyday. Lest you lose grade!

We hope that you will enjoy working in the laboratory.  
We wish you success.