Birla Institute of Technology & Science, Pilani
Hyderabad Campus

Second Semester 2023- 2024

Course Handout (Part II)

Date: 09/01/2024

In addition to Part I (General Handout for all courses appended to the timetable), this portion gives further specific details regarding the course.

Course No.: PHY F244
Course Title: MODERN PHYSICS LAB
Instructor-in-charge: **V. Satya Narayana Murthy**
Instructors:K V S Shiv Chaitanya, Meenakshi V, Kannan Ramaswamy, Tamali Mukherjee, NilofarNaaz

Scope and Objective of the course

The aim of the course is to introduce to students important experiments in Modern Physics which includes Quantum Mechanics, Optics and Nuclear Physics. The objectives are to supplement textbook learning with experimental demonstration and to impart experimental skills with particular emphasis on data collection and analysis of data.

Lectures and Experimental Notes

Introductory notes will be given for the experiments, and the Instrument manual for the experiments will be uploaded on *CANVAS*. It is mandatory to read the material related to your experiment before you come to the lab.

Course Plan **List of Experiments**

S.No.	Experiment
General Physics	
1	Quincke's tube
2	Electron Spin Resonance and Nuclear Magnetic Resonance
3	Frank Hertz experiment
4	Geiger Muller counter
Optics	
5	Brewster's angle measurement
6	e/m determination
7	Zeeman effect
8	Millikan's oil drop experiment
9	Photoelectric effect
10	Transverse electromagnetic modes in a laser cavity (demonstration only)

4. Evaluation Scheme

Components	Duration	Weightage (%)	Date and Time
Day-to-day performanceand analysis	2 hours	40	Open Book
Lab practical examination. Date will be announced in the lab.	50 minutes	40	Closed Book
Comprehensive written examination. Date will be announced in the lab.	1 hour	20	Closed Book

5. Make-up policy: It is applicable to the following two cases and it is permissible on production of evidential documents.(i)Debilitating illness, and(ii)Out of station with prior permission from the Institute.

6. Notices: All notices concerning this course will be displayed in CANVAS.

General conduct rules and guidelines

Each one of you will perform the experiment individually. You need to writethe lab record according to the format given in the table below. By the end of the 2nd day lab hour of the given experiment(3.00 PM), the lab record write-up needs to be uploaded to the CANVAS. Then only the experiment will be evaluated for 40%.

Apart from this you should maintain a *lab note book* in which you will record the sequence and the observations as you perform the experiment which may include successful steps, and erroneous procedures. At the end of each experiment, you need to get the signature of the instructor for the observations in the lab notebook, and on the same day, it has to be uploaded in CANVAS.

The record must contain the following parts

S.No.	Component
1	Aim / Objective
2	Introduction Figure or diagram
a)	Physics of the phenomenon
b)	About the Instrument
3	Experimental method
4	Data Collection
5	Analysis & Result
a)	Curve fitting
b)	Calculation & Error estimation
c)	Plotting, labeling the axes and units

6	Explanation for the agreement or disagreement of the result with theory

Active participation during the day or days of the experiment will be considered for awarding marks for performance. If the student is present for both days of the experiment and has shown the observations taken and these are signed by the instructor, a maximum of 20 marks will be awarded. *No marks will be awarded if a student visits the lab for the sake of attendance.*

You should understand the reading material before performing the experiment.

You are not allowed to enter the lab if you are late by more than 5 minutes.

You should repeat each experiment at least three times to estimate the error in your measurement. Error analysis should be done for all the experiments.

You have to write the record in your own words. Copying from internet and from other records is not allowed. If two or more records matter and data are same or copying from some other source is found you will be awarded zero marks for record.

Cell phones have to be switched off during the lab hours.

In this course, you will be graded for the scientific process and not for the final answer. Therefore, it is important to maintain academic and personal integrity. Ethical violations include cheating on lab data, plagiarism such as copying from sources from the internet, reuse of assignments, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty. Report any violations you witness to the instructor.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructors
PHY F244