

PHYS2023 Modern Physics Laboratory

Course Outline- Fall 2024

1. Instructor (s) – Name and Contact Details

Prof. Yilong Han room 4447, yilong@ust.hk

2. Teaching Assistant (s) - Name and Contact Details

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3. Meeting Time and Venue – Lectures, Tutorials/ Laboratory

Tutorial	Phys2023, T1	Monday 11:00 am - 11:50 am	LTG
Lab	Phys2023, LA1	Tuesday 9:00 am - 10:50 am	Rm. 4117A, Modern Physics Lab (via Lift 19/22)
	Phys2023, LA2	Friday 1:30 pm - 3:20 pm	
	Phys2023, LA3	Wednesday 1:00 pm - 2:50 pm	
	Phys2023, LA4	Thursday 11:00 am - 12:50 pm	
	Phys2023, LA5	Monday 12:30 pm - 2:20 pm	
	Phys2023, LA6	Wednesday 4:00 pm - 5:50 pm	

4. Course Description - Credit Points, Pre-requisite, Exclusion, Brief Information/synopsis
1 credit Corequisite: PHYS 2022, Laboratory accompanying PHYS 2022

Content

In Modern Physics Lab, students will learn how to make scientific observations and measurements, and how to present and understand these measurements by means of graphs and tables. Students will learn the inherent limitations of the measurements and how to assess accuracies and errors. These techniques can be, and are being, applied to a large number of fields outside physics, such as social, behavioral and life sciences. There are eight experiments scheduled for this course and we hope that these experiments will give students a greater conceptual “feel” and understanding of the principles which they have learnt in their Modern Physics lecture course. The eight experiments are given below:

5. Intended Learning Outcomes

(State what the student is expected to be able to do at the end of the course according to a given standard of performance)

By the end of the course, students will be able to:

1. Conduct experimental investigation of modern physics phenomena discussed in the lab manual;
2. Carry out measurements with proper techniques and safety practice;
3. Build and practice teamwork skills through group projects;
4. Practice record keeping of experimental work and data graphing;
5. Analyze data using simple statistics and regression and compare the results with theory;
6. Write a summary to explain the theoretical background and major experimental achievements and findings.

6. Assessment Scheme

<u>Assessment</u> (Percentage + assessment tasks)	<u>Assessing Course ILOs</u> (Respective course ILOs)
lab performance (20%)	1, 2, 3
lab reports (60%)	1, 2, 4, 5
lab summary (20%)	4, 5, 6

7. Student Learning Resources - Lecture Notes, Readings

lab manual, tutorial notes

8. Teaching and Learning Activities -

- a. Lectures:
- b. Tutorials: focus on basic skills on experiment and report writing
- c. Laboratory: focus on experiments associated with the theoretical course phys2022

9. Course Schedule

- a. Topics taught:* mechanics and thermal physics
- b. Weeks or dates of teaching specific topics (optional)*

8 Labs:

Direct measurement of the Speed of Light

Blackbody Radiation

Electrical Conduction in Solids

Photoelectric Effect

Charge-to-mass ratio of the Electron

Electron Diffraction

The Balmer Series of Hydrogen

Radioactive Decay and Radiation Absorption