

Physics 232 – Section 003 - Lab

Laboratory: Nielsen 508/510, Tuesday 10:10 AM-12:05 PM

Instructor: Mostafa Hussein

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Office Hours: Nielsen 201 (Tutoring Center), Wednesday 12:10-1:20 PM

Lab Manual: *Contemporary Introductory Physics Experiments* by Dr. James Parks,

Grading Scheme: (out of 100%)

40% Attendance, Participation and Lab Work

30% Lab Reports

30% Quizzes

Attendance, Participation and Lab work: Attendance is **mandatory** for the lab sessions. Each student should have an active role in performing the experiments and analyzing the data with the lab partner to produce the results. If for any reason a student cannot attend the lab, s/he should let me know as soon as possible.

Lab Assignment: Read and study the experiment due to be performed **before** the lab.

Lab Reports: Lab reports are due a week from performing the experiment and should be handed in to me before the start of the lab or before 10:10 AM in my mailbox when there are no labs. Each student must present his/her own lab report. Lab reports should be written in the student's own words. Each lab report will be graded on a scale from 0 to 10. Plagiarism is not tolerated; copying from the lab manual, or others is an automatic ZERO on the report. The lowest lab report score will be dropped.

Quizzes: At the start of each lab, I will give a short quiz on the material covered in the lecture or submitted homework relevant to the previous week's lab. Each quiz will be graded on a scale from 0 to 10. No make-up quizzes; the lowest quiz score will be dropped.

University Disability Statement: Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact the Office of Disability Services at 865-974-6087 in 2227 Dunford Hall to coordinate reasonable accommodations for students with documented disabilities.

Lab Schedule		
Date	Nielsen Room	Experiment
15-Jan	508	Simple Harmonic Motion
22-Jan		No Lab
29-Jan	508	Standing Waves I & II
5-Feb	508	Refraction of Light
12-Feb	508	Speed of Light
19-Feb	508	Simple Lenses
26-Feb	508	Optical Instruments
5-Mar	508	Diffraction of Light
12-Mar	508	Photoelectric Effect
19-Mar	508	Balmer Series
26-Mar		No Lab - Spring Break
2-Apr	510	Poisson Statistics
9-Apr	510	Attenuation of Radiation
16-Apr	510	Half-life of Ba-137m
23-Apr	510	Lab Makeup

Laboratory (Technical) Report

Lab Reports should be turned in a week after the experiment has been performed!

- I. **Title page:** A title page should include the following:
 - i. The Title of the experiment,
 - ii. Your name **and** the name of your lab partner,
 - iii. The course name and number and the section number
 - iv. The name of your lab instructor,
 - v. The date the experiment is performed, **and** the date the report is submitted.
- II. **Introduction:** IN YOUR OWN WORDS, explain the main purpose of the experiment and its significance. Clearly state the relevant physical laws, main equations and the definitions of the symbols used.
- III. **Experimental method:** (bullet form recommended)
 - i. List the materials and apparatus used in the experiment.
 - ii. IN YOUR OWN WORDS, briefly outline the procedure followed highlighting what measurements were made and for what purpose.
- IV. **Data, Tables and Graphs:** The data obtained from the experiment should be neatly presented in an appropriate form. All tables should be organized with a clear heading, each column must be labeled with the corresponding quantity symbol and units. You should include the original data sheets filled during the lab with the additional derived quantities. Graphs should include a title, and axis labels with units. The information obtained from the graphs should be clearly marked (such as regression lines and significant points).
REMEMBER HEADINGS, LABELS AND UNITS.
- V. **Results:** The main calculations from the data, tables and graphs should be in this section. Describe and show the main details of your computations as well as the units and associated error analysis (such as percentage error). If you do the calculations with the spreadsheet, remember to put labels and units on any additional columns, and state in the results how these columns were calculated.
- VI. **Discussion and Conclusions:** Discuss the main findings of the experiment, referring to the graphs and results obtained, and point out the key relationships between the variables. Compare the experimental results to the known or expected theoretical values. Comment on the error analysis and identify the sources of the errors, systematic and random. Indicate ways of improving the experiment in order to reduce the errors and obtain better results.
- VII. **Questions:** Answer all the questions posed in the lab manual giving **FULL** answers, describing and showing all your work.

Useful Technical Laboratory Report Checklist:

- UNITS** correctly stated for any value(s) mentioned.
- Main Equations** used should be presented and the symbols defined.
- Spell Check**.
- All sections** of the report should be present and titled: “Title page, Introduction, Experimental Method, Data, Tables and Graphs, Results, Discussion and Conclusion and Questions”.
- In the **Experimental Procedure**, declare any specific adjustments you made to your experiment.
- Data calculations and Graph labeling should be checked for **correctness**.
- Data, Tables and Graphs should be presented appropriately in an **organized manner**: i.e. no stray columns jumping pages.
- Error Analysis** should be presented in the conclusion. It should explain and **justify** the %errors or differences obtained in your experiment.
- If you plan on solving the Questions by hand, they should be in a **legible handwriting**.
- Show your full work in solving the **Questions**.
- Do not include irrelevant materials or blank pages (both sides).
- Read comments** on your previous lab reports and ensure that you are correcting previous mistakes.
- If you attach any data or questions at the end of the report please **clearly indicate** that in the report.
- Please use a **technical, formal and specific** language: no use of etc., pretty, very, good, bad, a lot, nice, like, dislike and all emotionally irrelevant language.