

# PHYSICS 1408/1409/1420/1430

## Spring 2024 Laboratory Syllabus

*Failure to read the syllabus will not be an excuse for an exception to any policy stated within the syllabus.*

The objectives of the laboratory are for you to

- Gain practical experience with concepts presented in your lecture section
- Gain familiarity with physical measurement equipment
- Present data and results in a clear and logical manner
- Analyze data and draw conclusions
- Describe and calculate uncertainty.

**Physics Lab Webpage:** <http://www.baylor.edu/physics/labs>

**Lab Supervisor:** Jared Fier, Ph.D. BSB E310, [Jared\\_Fier@baylor.edu](mailto:Jared_Fier@baylor.edu)

Office Hours: By appointment

**Required Texts:** For physics 1408/1420: *Baylor University Physics 1408/1420 Lab Manual.*  
For physics 1409/1430: *Baylor University Physics 1409/1430 Lab Manual.*

### Safety

1. You are expected to be familiar with the entire safety section in the lab handbook. Failure to follow these rules may result in your removal from the laboratory and will have a negative impact on your grade.
2. **Food and beverages are not allowed in the lab room.** You must leave these things outside or keep them in your closed backpacks. This includes personal water bottles! *Students with food or beverage containers in the lab room will be asked to leave the lab room and will receive a zero for that lab. NO exceptions. This is your warning.*
3. **You must wear closed-toed shoes in lab, no sandals.** *If you forget to wear closed-toed shoes then you will be required to leave the lab room, and you will receive zero for that experiment.*

### Lab Grade:

1. Your lowest lab grade will be dropped.
2. Your numerical lab average is provided to your professor at the end of the semester.
3. Your weekly laboratory grades will be entered into *Canvas*. **Check your grades frequently to ensure that your grades have been recorded correctly.** If your grades are not posted or the grades are posted incorrectly, notify your TA or Dr. Fier.
4. **Save all your graded work until the end of the semester** so that if a grade is incorrect, your TA or Dr. Fier can verify the correct grade and revise the recorded grade accordingly.
5. **No lab grades will be changed after 4 pm on July 9, 2024 (first summer session) or August 13, 2024 (second summer session).**

**Laboratory:** There are three components: the prelab, the experiment, and the lab report.

**Prelabs:** Prelab exercises are posted on the physics lab webpage. You will need to print the prelab for each experiment. Your answers must be handwritten. Prelab exercises are due, *without exception*, at the beginning of the laboratory period. *Late prelabs will receive no credit.* The purpose of prelab exercises is to prepare you for the lab, not to stump you; you are welcome to receive help before lab from the physics tutors.

Experiment: Bring your lab handbook to each meeting. The teaching staff will give a brief lecture. Ask questions when you do not understand. After the lecture, groups of two students will work together to collect data. In labs with more than 24 students, students may work in groups of no more than three.

If you do not bring your lab handbook, then take the data on notebook paper. (The teaching staff will not provide data sheets!) Do not assume that you will get data from your lab partner later. Lack of data, because you could not get it from your lab partner, will not be an excuse for a late lab report.

Lab Reports: Some lab reports are to be completed in class while you have immediate access to your lab partner, while others require a longer lab report which may be completed at home. All lab reports are to be turned in at the beginning of the next lab period (except for the last lab of the semester, which may be handwritten and will be turned in at the end of the lab period in which the lab is performed), using the time between labs to organize and formalize your lab report. The lab report (except for the data pages completed in the lab) must be typed and printed. You must leave the lab room with your own **data** and with **your TA's initials** on the data sheets. Lab reports turned in after the beginning of lab will be considered late. You will have 5 points deducted for each day the lab report is late. **Lab reports more than one week late are not accepted.**

There is a box in the Physics Department office (3<sup>rd</sup> floor BSB D.311) for late lab reports. Be certain to include your lab section and your TA's name on the cover page of your lab report. Any late lab report submitted without this information is subject to a 5-point penalty.

Although you may work with your lab partner or others in analyzing your data, you must submit your own lab report, in your own words. **You may not submit tables, graphs, figures, or any other parts of a report that are duplicates of someone else's work.** You are not allowed to photocopy data sheets. If you are absent, you may not obtain experimental data from other members of your class. Lab reports will be graded on *originality* as well as *completeness* and *correctness*. There is a sample lab report on the Physics Lab Webpage.

Grade: Eighty-five percent (85%) of your lab report grade is from your written lab report and fifteen percent (15%) is from your prelab assignment/quiz.

Your lab handbook has a rubric for each experiment. **You will turn in that rubric with your lab report.** Your TA will return the scored rubric with your graded lab report. Most of the rubric is easy to understand.

**The Baylor University Honor Code will be strictly enforced.**  
(<http://www.baylor.edu/student%5Fpolicies/index.php?id=32287>)

**ABSENCES:** The lowest lab grade is dropped. This means that you may miss one of the labs without penalty. The maximum final lab grade is capped at 100. If you miss a second lab you may request to attend the end of semester make up lab as described below in order to avoid a zero being recorded for the second absence. Additional absences beyond two are figured as zeroes in determining the final lab grade. Your appearance in the laboratory and submission of the prelab assignment constitute attendance for the experiment. You may not leave early and/or fail to turn in the lab report and later claim that experiment as an absence.

**The drop lab will not show up on Canvas, I will manually drop the lowest lab when grades are collected at the end of the semester.**

**End of Semester Make Up Lab: 1:15pm on July 9, 2024 (first summer session) or August 13, 2024 (second summer session)**

- **This make up lab is only for those with more than one absence from lab during the semester.**
- You must register in advance for this make up lab by applying for attendance to Dr. Fier. Permission to attend will be given up to the size limit for the laboratory (24). An email will be sent late in the semester to inform you when applications are being accepted for the makeup lab along with a deadline for applying for the makeup lab. **DO NOT APPLY FOR ATTENDANCE TO THE MAKEUP LAB UNTIL YOU RECEIVE AN EMAIL FROM DR. FIER ANNOUNCING THAT APPLICATIONS ARE BEING ACCEPTED.**
- Include the following information when applying for the make up lab:
  - Your name,
  - Your student id number
  - Course number
  - Name of your TA
  - Your lab section (A1, B2, etc)
- **Without approval, you may not attend the end-of-semester make up lab.**

**Changing Lab Sections:** You may not change lab sections without going through the proper registration procedures. You may not attend a lab section other than the one for which you are registered.

**Lab Equipment:** Do not place your book packs on the equipment! The equipment used in these laboratories is often expensive and difficult to replace. If you damage lab equipment, we will send you a bill.

**Special Circumstances:** If you have specific physical or learning disabilities and require special accommodations, please notify Dr. Fier early in the semester, so that your learning needs may be appropriately met. Letters from the Office of Access and Learning Accommodation should be presented to Dr. Fier, not your TA.

**Free Physics Tutors:** Physics tutors are available through the physics department. The tutoring schedule is on the physics webpage. The tutoring area is in E.305 in the Baylor Sciences Building.

**Conflicts:** If you have any problem with this course, you should first discuss it with your TA. He/She is there to help. You will find that your TA is generally willing to assist in any way that he/she can. In the event that you encounter a problem that you are unable to resolve with your TA, feel free to contact Dr. Fier.

## **Expectations:**

### General

1. You will be proactive in understanding what is needed to do well in lab. When you do not understand something, ask!
2. You will only attend the lab section that you are assigned.
3. You will bring your textbook, lab texts, calculator, and writing materials to each lab meeting.
4. You will not assemble or manipulate the lab equipment until told to do so by the teaching staff.
5. You will immediately report anything out of order or a shortage of materials to the teaching staff. You will not substitute equipment between lab tables.
6. You will leave your area neat and organized. (Lab rooms will be randomly inspected by Dr. Fier at least twice during the semester. If, after lab, the lab room is not clean and orderly, then each student in that lab section will have 5 points subtracted from his/her lab report grade for that experiment.)

### Experiments

7. You will read every experiment prior to coming to class to do that experiment. You will, as thoroughly as possible, examine the physical principles involved with the experiment being performed. It is your responsibility to ask questions about any theory not covered in your lecture. (You will enjoy this course and be more successful if you come to lab each week having prepared for the experiment.)
8. You will turn in the prelab for the experiment at the beginning of lab.
9. You will form teams of two students. Each of you will participate in all aspects of the experiment; you will not break an experiment into "sub-tasks" to be performed separately.
10. You will use the Laboratory Report Record in your lab handbook to keep a record of when you turned in your lab reports.

# **PHY 1408/1420 Experiments**

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## **Experiments**

- 1 Measurement and Error Analysis
- 2 A Study of Concurrent Co-planar Forces
- 3 Friction – Motion on Inclines
- 4 Projectile Motion: 2-D Kinematics
- 5 Centripetal Force
- 6 Ballistic Pendulum
- 7 Collisions
- 8 Torque and Static Equilibrium
- 9 Rotational Dynamics
- 10 Standing Waves on a Wire
- 11 Specific and Latent Heat
- 12 Archimedes' Principle

# PHY 1409 / 1430 Experiments

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## Experiments

- 1 Cathode Ray Oscilloscope
- 2 Ohm's Law
- 3 Kirchhoff's Rules
- 4 Electric Fields
- 5 RC Circuits
- 6 Magnetic Force on a Wire
- 7 AC Circuits
- 8 Electron Charge to Mass Ratio
- 9 Thin Lenses
- 10 Radioactivity
- 11 Interference and Diffraction
- 12 Diffraction Grating