Physics 119 Laboratory: Laboratory Structure and Requirements

General Comments and Introduction

This third quarter of the Algebra-based Introductory Physics labs is all about OSCILLATIONS AND WAVES. Physics 119 is a separate C/NC 1-credit course, but most people take it in conjunction with the lecture 116. Most of the lab is similar to the lab part of 123. Now that you have learned a lot of physics in the previous two quarters, this lab uses your knowledge through a series of applications to oscillations and wave phenomena. The first three labs are on oscillations and mechanical waves and the next 5 labs on electromagnetic (light) waves. We will develop the subject of geometrical optics (reflection, refraction, mirrors, and lenses) more extensively than in your lectures and as one unified topic.

A very important aspect of experimental work is the idea of "uncertainty". We will focus on developing a familiarity with this basic concept so that it becomes second-nature to think about the uncertainty whenever you think about a measured quantity.

There are labs Tuesday through Thursday. The last week of instruction will be used for a universal make-up lab for those who have missed a lab earlier in the quarter. If you have completed 7 lab experiments, you do not need to attend during that last week.

Course Instructor

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Laboratory Manual

The Laboratory Manual for Physics 119 must be purchased at the UW Bookstore. Students are required to purchase the Laboratory Manual **before** their first laboratory session. It should be available by Monday, June 22.

HELPFUL HINTS:

- Your insight into the lab will be improved if you read the material in the text referenced above before coming to lab.
- For all labs, you are expected to learn from your observations. Your TA will confirm your solutions rather than supply them. At the beginning of the lab period, your TA may, at most, give a brief description of special features of the lab and lab equipment. If you are taking 115 concurrently, lectures will occur four times per week in the lecture halls.
- Physics concepts will sometimes appear in laboratory **BEFORE** you see them in lecture. The most important of these will eventually show up in lecture, homework and exams. *Concentrate in the laboratory on observing and understanding the phenomena.* You will get practice on quantitative problem solving in your lecture homework.

Lab Reports

You are required to submit your lab report for grading at the conclusion of each lab period. **Labs may not be taken from the room**. Your TA will initial the report to verify the work done. **Reports without initials will not be accepted.**

The lab instruction sheets contain spaces in which the answers to questions posed in the lab are to be written. **In all cases these answers are to be written in complete sentences!** A simple "Yes" or "Same" or similar one-word answers are not considered to be complete sentences.

Measurements should be made carefully and recorded with attention to the appropriate number of digits. If a length of approximately 12 cm is measured to the nearest millimeter, the result should be written with a digit in the 0.1 cm place. For example, if the measurement gives a length 3 millimeters longer than 12 cm., it should be written as 12.3 cm. If it gives 12 centimeters to within 0.1 centimeter, it should be written 12.0 cm. Written in this way, the number indicates that the measurement was made to the nearest millimeter. It is said to have three *significant figures*. All your measurements must be written with the appropriate number of significant figures.

You must submit a separate lab write-up even though you will be working with another student. Partners are expected to discuss their answers with one another and should agree on the measurements and try to agree on the answers to all questions.

Lab Maintenance

For the smooth functioning of the lab, it is **imperative** that equipment be returned to the lab bench arranged properly. A picture showing the location of the equipment and an equipment list will be at your lab station. Check the equipment at the start of the lab. If anything is missing or broken ask your TA for a replacement. Do NOT take equipment from another lab station. When you and your partner have finished a lab, call the TA to your lab station. The TA will initial your report **IF and only IF** all equipment is back in place. *Food is not allowed in the lab. Drinks are OK*.

Labs at Other Than Your Regularly Scheduled Sessions

If, for medical reasons or for unavoidable scheduling conflicts, you are unable to attend your scheduled lab section, you may request permission to attend another lab section **during the same week**. Permission must be obtained from your section TA *as well as* the TA for the section you wish to attend [**or** as a last resort, from the lab instructor.] Reports completed in other than your regular session must be turned in at the end of the session and *may be graded either by the TA of that session or your regular TA, at the option of the TA of the session you attended*. If you complete a lab in a section that is not your own, it is especially important that you provide all the information required at the top of the report, otherwise there is a real risk that the report will be lost.

Make-up Lab

If you miss a lab and cannot attend another section the week the lab is offered, there is ONE universal make-up lab scheduled in the last week of the quarter. It will replace the missing ONE of the other 7 labs. There is NO provision for any additional make-ups. Like any other lab, the make-up lab must be done completely during the universal make-up lab session. **DO NOT** bring a completed or partially completed report into a make-up session. This is cheating and will be reported as such.

It is especially important for make-up labs (either done in the same week or the universal make-up at the end) that the TA (1) marks that you are present and (2) initials your lab report when it is completed. Lab reports that are not initialed, or from students not marked present at the make-up session, will not receive credit.

Grading

Graded lab reports will be returned to you either on exit or one week after the lab is completed. You can and should check the status of your lab reports on line through the WebAssign homework system. If your score has not been recorded by the return date, ask your TA about it. Missing reports and missing scores do happen and should be dealt with as soon as possible during the quarter. If you do not receive a satisfactory response from your TA, contact the course instructor (Prof. Pedigo) within two weeks of completing the lab.

TO RECEIVE CREDIT FOR PHYS 119 YOU MUST:

(1) Submit initialed reports for ALL 7 labs.

(2) Receive a passing grade on each of the 7 labs.

If you complete fewer than 7 labs, you will receive no credit (NC) for PHYS 119.

Your TA will be encouraged to look over and perhaps grade your report before you leave each lab session **if time permits**. This will allow the TA to notice common errors that would obviously cause you to fail the lab, and to arrange for you to redo the erroneous work. So there is an advantage to those who finish early: they may have an opportunity to correct their work before the session ends. Reports that are judged unacceptable after the lab session is over will be returned to you along with a list of work to be completed in order to receive credit. This may vary from a simple recalculation of some values all the way up to a "fail", which will require that you attend the make-up session. Reports judged acceptable will be returned with credit indicated.

Because credit is required for all 7 labs, and each is judged **pass or fail**, TA's generally enter a "1" for credit as a score for each lab in the WebAssign system. You should expect to see a "1" entered in WebAssign for each of the 7 labs by the end of the quarter. Your TA may wish to grade your reports on a different scale, such as 0 through 5, so that you can have additional feedback on each lab as to how you are doing relative to others in the course. In any case, if you feel the need for additional feedback about how you are doing, ask your TA.

Lab Grades on WebAssign

All grades for the Physics 119 laboratories will be entered by your TA and will be available on the WebAssign homework system. This summer is our first use of this system, so be prepared for a few hiccups. However, you should still expect to see your grades posted in a timely fashion.

Physics 119 is a Credit/No-Credit course, so the lab grades will be entered on WebAssign as 0 or 1.

Check your scores on WebAssign regularly. This is the record by which you will be awarded credit for the course. Mistakes caught early are usually easy to correct, whereas those caught after several weeks have elapsed may not be correctable at all.

TA's will have entered your scores by Friday of the week following the week in which a lab was completed.

Final Words

Of course, the main goal here is that each student learns some physics and develops a better understanding of the way the universe works. The big picture can sometimes be lost when blindly following a procedure you do not understand. It may help if you regularly ask yourself "What am I supposed to learn by doing this particular task?" When no answer presents itself, consult your lab partner(s) or your TA.

Despite all the rules it is possible to enjoy your PHYS 119 lab experience. We hope you do!