

## Laboratory Syllabus University Physics (Phys151/152)

An essential part of understanding physics is performing experiments and interpreting the results. You will perform weekly experiments throughout the semester that will reinforce the concepts covered in the lecture portion of the course. Instructions for each experiment can be found on the Physics Department web site.

YOU MUST PRINT OUT AND READ THE LAB INSTRUCTIONS *BEFORE* THE START OF YOUR SCHEDULED LABORATORY PERIOD! PRINTING THE INSTRUCTIONS AT THE BEGINNING OF LAB IS RUDE AND DISRUPTIVE. WE RESERVE THE RIGHT TO IMPLEMENT A PRE-LAB QUIZ ABOUT THE LAB INSTRUCTIONS IF THIS BECOMES A PROBLEM!

Experimental work can usually be completed during the three-hour lab period. If the completed report has not been turned in, students are expected to be working in the lab until 4:00 P.M. – the start of sports practice is NOT an acceptable excuse for leaving before 4:00 P.M. Details about the structure and content of lab reports are found in the *Introduction to Laboratory Practices* document found on the lab list page.

- If more time is needed, you have *until 4:00 P.M. the following day* to turn your report in to your instructor. Lab reports will not be accepted after this additional time. Please inform your instructor if you need to make other arrangements.

Your lab partner may help you but may not do your work for you. To report your partner's work as if it were your own is plagiarism. (Check the *Student Handbook*, under 'Academic Honesty' if you are unsure as to what constitutes plagiarism. It is your responsibility to be aware of the rules.)

### Grading:

The evaluation of each week's lab work comes from the written report and the experimental work performed. You will also have a question related to each experiment on your weekly class quiz, and a lab practical near the end of the semester, so be sure that you understand the concepts covered in the lab.

#### *Lab Practical:*

The lab practical will test you on the basic data collection and analysis skills you will be learning throughout the semester. The lab practical counts as **25% of your total lab grade**. The date of the practical appears in the list of experiments on the Physics Department web site.

#### *Experiment Comprehension Quiz Question:*

You will be asked one question about the experiment you performed in the previous week on your weekly classroom quiz. Your score on this question counts as **15% of your total lab grade**.

### Laboratory Attendance Policy

Attendance and participation in lab is required to pass the lecture portion of the course. Students are expected to attend lab on their regularly scheduled day. If you know ahead of time that you will be unavoidably absent, due to participation in a University-sponsored activity or due to compelling personal reasons, please arrange with your lab instructor to perform the experiment during another lab period.

An experiment not performed at the scheduled time will receive a failing grade unless a prior arrangement has been made or a bona fide emergency arises, in which case the instructor may make an adjustment.

### Laboratory Supplies

We will supply you with everything you need: paper, rulers, computers and measurement instruments. The only thing you need to bring is a pen or pencil, a calculator (*that you know how to use*), and a willingness to work.

## How to Succeed in Physics Lab

Follow the suggestions below to enhance and optimize your time in lab:

1. Read the instructions before coming to lab. You have 3 hours to complete each experiment, and you will be better able to manage your time if you have some basic idea of the tasks that you will perform.
2. **WHILE IN LAB, READ AND FOLLOW THE DIRECTIONS CAREFULLY!**
3. The notes on the blackboard are for the pre-lab discussion; don't include these notes in your report (the content will probably appear there at the appropriate time.) *You can't do the experiment from the blackboard notes.*
4. In your report, briefly describe what it is that you are measuring, calculating, etc. (e.g. *What did you do to collect the data in the table?*) Note that you **should not** describe the details of the procedure.
5. Use careful technique when taking measurements.
6. Check your calculations against your partners (don't rely on your partner to do all the calculations!)
7. Don't pad your report with *b.s.* – just get to the point.
8. The instructions will typically include one (or more) sketches. All sketches that are in the instructions **should** be in your report, in the appropriate place (don't put all the sketches at the beginning of your report)
9. Use a ruler when you need to draw a straight line!
10. **READ AND FOLLOW THE DIRECTIONS CAREFULLY!**
11. Use plenty of paper – don't squeeze your writing onto a page. Ask your instructor for more paper if needed.
12. *Units* should accompany numerical values when appropriate! Units must be displayed in data table column headers, for a final result, or any 'new' result that is used in a subsequent calculation (e.g. slope, or an earlier calculation.)
13. Don't assume that the units will work out! If you're calculating a force, check that the units of the quantities measured give you force units.
14. Answer all of the questions that are asked of you in the instructions.
15. Your discussion will always include a consideration of the sources of error and measurement uncertainty in the experiment. Think about this carefully; the answer won't always be obvious. Do not assume that your error was due to your inability to measure a quantity to high precision. The experiments performed this year do not need this level of measurement precision to demonstrate the theory under investigation.
16. When you have questions, be sure to ask your instructor! However, this should not replace careful reading of the instructions. If you ask "what do I do next?" you'll surely be greeted with a snort of derision.
17. **READ AND FOLLOW THE DIRECTIONS CAREFULLY!**

## Laboratory Etiquette

When you arrive in lab, your bench will generally have the equipment that you will need to perform the experiment, neatly arranged on the table. Since there are many lab sections performing the same experiment in this room, we ask that you please keep these rules in mind when you have finished your experiment:

1. Return all equipment to its original configuration at the beginning of lab. Disassemble anything you put together, and arrange it neatly on the lab bench. Please push your chair under the bench. Ask your instructor if you have any questions about what should be left in place.
2. Turn off any electronic equipment that was used (photogates, power supplies, and computers). Please shut down the laptop computers when you are finished.
3. Remove any tape that you applied to the bench or floor.
4. Return plastic rulers and protractors to the appropriate box on the instructor's bench. Likewise, do so for any sheets of graph paper that you did not use.
5. We generally allow students to eat lunch during lab (the exception will be during a nuclear radiation experiment.) Please clean up any spills and trash that you have created and place in the appropriate wastebasket. *Please place paper and plastic recyclables in the marked container!*
6. Be sure that you have gathered all of your belongings before leaving the lab: jackets, textbooks, notebooks, calculators, cell phones.