

## Physics 231 Laboratory Syllabus

### Time

Physics 231 LAB  
Day: Tuesday  
2:30 PM – 4:25 PM

### Instructor

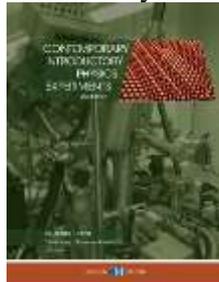
Charles Hughes, chughe26@vols.utk.edu  
Office Hours: Friday 2:20 PM – 3:20 PM in room 201 or by appointment  
Physics Tutorial Center (Nielsen 201)  
TA Office: SERF 209

### Course Description

This is the supplemental laboratory phase of the Physics 231 course. The purpose of this laboratory is to expose you, in a hands-on laboratory setting, to the physics topics covered in lecture. You will be required to perform experiments covering a wide range of physics concepts. In order to get the most out of this class it is important that you read the lab before you come to class and start to make your own predictions about what your results will be. Due to scheduling, many of the labs come before you learn the concepts in class, I will help by giving a brief overview at the beginning of each lab, but it will be helpful if you go read about the topic in the textbook. Feel free to email any questions you have about the lab and the reports you will need to write.

### Course Materials

The laboratory manual for Physics 231 is Contemporary Introductory Physics Experiments, 2<sup>nd</sup> ed. by James E. Parks, Hayden-McNeil Publishing, ISBN 978-073806168-9. This manual is available at the UT Book and Supply Store. All of you should have a copy of the laboratory manual before the first lab class. Please make sure to bring this book to every laboratory session.



### Lab Reports

Every student must write their OWN lab report. At the start of every laboratory session, you will be required to hand in a lab report over the previous week's experiment. **No late lab reports will be accepted.**

**Lab Reports:** Each lab report is due the next lab session; however, I strongly encourage you to finalize your lab reports after class. Each lab report is worth 40 total points. All lab reports should be written in Times New Roman, 12 point font.

**Full Lab reports should contain the following sections:**

**1. Title:** At the top of the first page, please include the following:

- a) Your name and your partner's name
- b) Lab section number and date of the experiment
- c) The title of the experiment
- d) The submission date.

**2. Introduction/objectives:** describe the objective and importance of the lab in your own words in a paragraph.

**3. Theory and Procedure: Briefly** describe the theory behind the experiment in your own words. Don't copy the entire theory section of the lab manual. Write down the important formulas and define all variables with *units*. Please put each formula on a separate line like the lab manual does. Also, make sure to give each formula a number so you can refer back to it easily. For example, with voltage ( $V$ ) measured in volts, current ( $I$ ) in amps, and resistance ( $R$ ) in ohms. In your **own** words, describe what you did in the lab so that a student with the same physics background could run the lab themselves. Provide a clearly labeled picture; this can be drawn in MS paint or taken with your camera phone. Be brief but make sure all the important steps are stated without copying out of the manual.

**4. Data/Results:** Report all your data/graphs in an organized fashion, highlight patterns through graphs if applicable. Please do **not** forget to write down the units of the data obtained. **Label axes and provide a legend for plots with multiple data/trend lines.**

**5. Analysis:** Describe the results in your own words by using the physics concepts discussed in the theory section. Make sure to think about your results and whether or not they make sense. Figure out if you had changed a different variable, what that would have done to the experiment. This is where you should show your true understanding of how the theory shows in the experiment. Please come ask for help with this section if you are having trouble with it.

**6. Conclusion:** State the main findings of the experiment, report trends, establish relationships between variables and make connections with the theory behind the experiment. For example, "We found that there is a linear/exponential/logarithmic relationship between the measured variable ... and ... this can be seen from the graph (insert graph title here)." Also state whether your results agree with what is expected.

**Explain the possible sources of error and the impact they may have on the results, if any.** For example, meters are not always right, human error can be a factor (please discuss what you mean specifically for this), computers are not always right, heat loss to the environment, constraints of lab conditions, etc. Discuss whether you felt the experiment was successful and things that you learned that are particularly interesting to you.

**IF THERE IS A SHORT REPORT ASSIGNED, THEN YOU ARE EXPECTED TO PROVIDE SECTIONS 2, 4, AND COMBINE SECTIONS 5 & 6 INTO ONE SECTION.**

**Be Honest:** If your results are not what you expected them to be, talk to me. If you performed the experiment to the best of your ability and there was an error, you should still report your findings – that's a part of the experimental method. Do not copy data from another group or make up your own data to fit the theory.

The graded lab reports will be returned to you the next lab (this means typically one week later).

### Attendance

Lab attendance is mandatory. It is expected that you are on time for every lab session. **Do not be late.** If you must miss lab due to extenuating circumstances (i.e. serious injury, illness, or a death in the family) it is your responsibility to contact TA as soon as possible. TA may allow you to make up the laboratory during the same week.

### Quizzes

Lab quizzes will be given each week at the beginning of lab in order to test your initial understanding of the lab. Be prepared to know what lab is assigned each week, the main goals of the lab, and some important equations given in the theory. By reading the lab before you get into class each week, the lab will run more smoothly and help with your understanding of the material.

## **Typical Grading Procedure**

Lab Reports 80%

-5% full lab reports (there will only be one or two of these and you will know ahead of time)

-75% Data with questions, Short Report (NOT a full report)

Participation Credit 10%

Quizzes 10%

Your earn participation credit if you are on time and actively contribute to data taking in the lab.

### **Classroom Policies**

Please respect your fellow students and please respect your TA. Do not come to class late. Do not talk when TA is talking. Turn off your cell phones and music players and pay attention!

All students are expected to abide by the University Honor Statement. Any kind of cheating will not be tolerated. In this course, cheating might include making up data, copying off your neighbor on quizzes, or handing in a lab report that is partially or fully identical to another student's. If TA catches you cheating, s/he will assign you a zero for whatever it is you are cheating on. A second offense will result in a grade of zero for the laboratory portion of the course and a report to the Office of Student Judicial Affairs.

### **Course Outline**

The schedule of experiments can be found online at

<http://www.phys.utk.edu/labs/Spring%202016%20P231%20Lab%20Schedule.pdf>

If this schedule changes, TA will notify you by e-mail.

**If you need course adaptations or accommodations because of a documented disability, please contact the Office of Disability Services (ODS) and make sure that they contact me. This will ensure that you are properly registered for the services provided by ODS.**

Disability Services

2227 Dunford Hall

Knoxville, TN 37996-4020

Phone: (865) 974-6087 (v/tty)

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Email: [ods@utk.edu](mailto:ods@utk.edu)

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