

University of Mississippi
Department of Physics and Astronomy

Physics 223 Syllabus Fall, 2020
Laboratory for Physics 213

Instructor of Record:

Dr. Jennifer Meyer – 211B Lewis Hall; jameyer2@olemiss.edu

Lab Physicist:

Dan Miller – 121B Lewis Hall; dbmille2@olemiss.edu

Required Materials: Notebook, calculator, and pencil.

Lab completion: Completion is mandatory. A zero grade will be assigned for unsubmitted labs.

Missing three labs will result in a final grade of F.

General Guidelines and Format:

Given the current circumstances, this lab will be conducted in a hybrid format. The central aspect of a science lab is the real world execution of some experiment and data collection, in an effort to confirm and illustrate the principles being covered in the corresponding course, and to demonstrate that in reality things rarely work as neatly as on paper. To this end, we will attempt to have all students completing each experiment and collecting all of their own data, while everything else will be moved online via Blackboard. Some of the labs do not require any special equipment, and you will not need to physically come to the lab at all those weeks. The general format will be for lab materials to be provided on blackboard at least 3 days before your lab, along with a prelab quiz. Students are expected to review those materials and complete the prelab quiz before attending their lab for the week. One half of each section will attend for the first hour, and the second half for the second hour, divided by last name. The prelab material will include not only the printed instruction, but a video introduction and walk-through of the procedure, demonstrating the function and use of any and all equipment utilized. Upon arriving to the lab, you may proceed directly to your table; once at your table, you may sanitize all equipment and begin collecting your data, and you may leave as soon as you have collected your data. If the equipment is not functioning properly, your TA will be in the room to assist, but please consult the video walk-through before asking your TA to come over to your table. You will have a few days to complete the rest of the worksheet and submit it on blackboard for grading.

Graded Work

- Math Review – One math review will be given to assess requisite mathematics skills. Assigned and submitted on Blackboard the first week.
- Quiz – Conceptual and comprehension questions, the focus is on the current experiment. To be completed on blackboard prior to coming to lab to complete an experiment.
- Worksheet – To be completed as the experiment is conducted. While some experiments will be fully online, most weeks an experiment will be conducted and data collected in lab, with conceptual questions answered later and the work submitted on blackboard.
- Lab Reports – Students are required to write two lab reports. Lab reports are due as announced. Further instruction will be given prior to the first report.

Late Policy: Lab reports are subject to the following late policy.

0-24 hours late: 10% deduction

24-48 hours late: 30% deduction

>48 hours late: zero grade

Plagiarism Policy:

As per the M book, in cases of plagiarism both the student who copied and the student who provided the copied material will be penalized in the same manner. Sharing lab reports for any reason is strongly discouraged. Safe Assign, the software which will be used to evaluate reports for plagiarism, is far more sophisticated than most students realize. Please do not try it, you will get caught.

Grades will be posted on Blackboard so that you can verify and keep track of your grades in lab. Keep all graded assignments until your final grade is posted at the end of the term. Grading mistakes will not be corrected without the TA-graded assignment.

Your final grade is based on: Quiz Avg: 20%, Worksheet Avg: 45%, Lab Report Avg: 30%, Math Review 5%

Grading Scale: $A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$

The instructor of record reserves the right to decide whether or not to curve or adjust any/all grades.

University of Mississippi

Department of Physics and Astronomy

COVID-19 Guidelines:

- Properly worn face coverings are required when in Lewis Hall (as is the case for all University buildings). You will be provided disinfecting wipes in order to wipe down surfaces that you will touch while in the lab.
- In adherence with the University's COVID-19 guidelines (which includes 'facial covering, social distancing, hand hygiene, etc') that has been provided to you all by the University, you will not be allowed in the lab (or asked to leave the lab) if you do not comply with these guidelines.
- Failure to adhere to health requirements relating to COVID-19 will be deemed disruptive to the classroom and will be enforced following the Academic Conduct & discipline procedures.
- Both students and faculty must quarantine for 14 days if they have a positive COVID-19 test, possible virus exposure, or display any symptoms related to COVID-19. If you are ill or quarantining, stay home and do not come to campus, including physics lab. Send an email to both your lab TA and Dan Miller to make alternative arrangements to complete that week's lab.

Nonsense points

- You are expected to use common sense in this lab. Should you submit completely unreasonable answers, you may lose more points than are marked on the worksheet (e.g. In response to "Measure the length of the block," you submit "23 meters," that's about the width of a 100 seat auditorium...). Every experiment in this lab exists in reality; thus you should check to make sure your data is realistic. 1 meter is just over 3 feet; 1 meter per second is about 2.24 miles per hour (a ball fired with a velocity of 120 m/s would put a hole in the wall or you); objects in free fall near the surface of the earth accelerate at 9.81 meters per second squared (unless there is some force other than gravity acting on an object, it cannot accelerate at a rate greater than this); a 120lb person has a mass of about 55kg and a weight in standard units of about 500 Newtons.
- The importance of **units** cannot be overstated. Recognizing proper units will help you to both communicate more effectively and understand the quantities being explored. For each measurement recorded with the wrong units you will lose either 1 or 3 points, 1 point for the wrong prefix (something such as millimeters (mm) instead of centimeters (cm)), and 3 points for the wrong units entirely (something such as kilograms (kg, units of mass) instead of Newtons (N, units of force)).

Basic definitions to keep in mind

- **Mass:** A measurement of how much stuff (matter) something is comprised of.
- **Weight:** A measurement of force due to gravity. *Mass and Weight are NOT the same thing!!!!*
- **Force:** An action capable of accelerating an object. When you jump you exert a force on the ground to push yourself upwards, and the force of gravity acts to pull you back to the earth.
- **Heavy/Light:** These are vague terms and their definitions change depending on the context. One might say that "lead is heavier than cotton" to say that lead is more dense, "a truck is heavier than a car" to say that the truck has more mass, or "an object is heavier on earth than it is on the moon" to say that it has more weight. Refrain from using the words heavy and light in this lab. Rather, say "lead is more dense," "a truck has more mass," or "weight is greater on earth."

Some helpful advice

It is far too common for students in this course series to be their own worst enemy. You already know how most of these principles work and employ this knowledge on a daily basis, we are simply showing you the math behind them. Most students create the difficulty associated with physics themselves: they decide before even entering the room that "physics is hard and I won't be able to understand this." Every semester we see hundreds of students over-complicate simple problems because "it can't be that easy." It is that easy, and you can do this. Stop telling yourself you can't and your odds of success will increase drastically. This is an incredibly difficult course to attempt to memorize your way through, every problem can be presented many different ways. If, instead, you learn the underlying concepts and principles, you will find the majority of this material to be intuitive and straightforward.