

# Physics 9B Laboratory Syllabus

## I. General Information

Welcome to Physics 9B lab! Here are a few basic things you need to know about these labs:

- Let's start with the most important things for you to know (there will be more on these later, but these need to be the first thing that you read):
  - You must **submit a lab report for every single lab** – there are no lab scores "dropped." Failure to do so will adversely affect your course grade, including a possible failure of the class.
  - You must **attend every lab session** unless you have a verifiable emergency. Failure to do so will adversely affect your course grade, including a possible failure of the class. If you have too many "emergencies" that cause you to miss several labs, then petitioning for a late drop from the Dean's office is appropriate.
  - You must **submit an answer for every pre-lab assignment** during the time allotted at the start of lab. If you come too late to do this, you'll have to attend another lab as a make-up. You have not shown adequate commitment to your lab partners by being so late, and you cannot be included in the lab report submitted by your group.
- Lots of information about labs in general, as well as some specifics on writing lab reports is available in the [Read Me page of the online lab manual](#). Some of the more important points will be repeated here, but it's not an overstatement to say that one cannot have a successful experience in lab without going to that page of the online lab manual early and often.
- The lab activities are designed so that they are *not* "cookbook." That is, you will not be given a list of specific instructions to follow so that every experiment works out exactly as it you would expect. Instead, you are given background information (most of which you will already be somewhat familiar with from lecture) and some basic criteria for what you are to explore. Then you are expected to design your own experiment, using equipment that has been set out for you. There are no "rules" with regard to how you perform your experiment, except those that protect the safety of students and equipment, and of course you have to maintain impeccable scientific integrity – no fudging data! A good example of this "no rules" approach involves the use of smartphones. Some students think that they are restricted to work only with the equipment they are given in the lab, but smartphones have capabilities (such as video recording) that can be very useful in collecting accurate data, and you are free to make the most of these devices.
- Each week of lab consists of preparatory work at home before coming into lab, punctual and consistent attendance, and active participation within your group. The importance of doing the preparatory work cannot be overstated.
- The early labs for 9B are a little sparse in their physics content (you've only just started!), and are used as training for elements of data analysis, such as uncertainties and graphical methods.

## II. Online Laboratory Materials

There are three important links for the labs:

- [Physics 9B Lab Web Page](#) – This is the page where you likely downloaded this syllabus. It includes the schedule of labs for the quarter, and a list of all section meeting times and lab TAs to assist you when you may need to do a make-up lab.
- [Physics 9B Lab Manual](#) – Here you will find the 9 labs you will be doing this quarter written in the LibreTexts platform. Every lab includes a portion on background material you will need to perform the lab, and a portion that details the activities related to the lab.
- [Physics 9B LibreText](#) – This is an online textbook often used for the course, portions of which are required reading for lab preparation. Links to the appropriate sections for each lab are provided in the "Background Material."

## III. Weekly Routine

### before coming to lab

- Read the Background Material section in the lab manual for that week's lab. This material is usually a brief extension or review of material from lecture, but sometimes it is completely independent of the lecture.
- Read through the Activities section in the lab manual to get some idea of what you will be doing when you come in.

### in the classroom

- Meet with your group. If you are there to make up missing your regular lab, tell the TA, and they will assign you to an established group of 2 or 3 students – *you cannot be the fifth member of a group*.
- Work with your group to complete the **pre-lab assignment**.

- This is a Canvas quiz, based on the background material and lab activity you are about to perform.
- You will have 15 minutes to do this, and your performance could impact your lab grade.
- While group members can work together to determine an answer, every individual in the group must answer the question(s) on their own Canvas page.
- Make a note of any preliminary comments about the lab (perhaps prompted by the pre-lab) from your TA.
- Discuss how you want to proceed with your group members.
- If appropriate, do a "dry run" to become familiar with nuances of the equipment before you start making "real runs."
- Perform the experiment(s), recording data and noting important details.
- Confer with group as you craft a lab report. It's okay to delegate tasks like data tables, graphs, and explanatory prose, but everyone in the group should understand every element of the lab report.

#### submitting the report

- **Everyone within the group must submit their own copy of the lab report to Canvas.** For record-keeping purposes, everyone must have their own copy of the lab report on file in Canvas. If just one copy of the lab report is submitted by a single group member "for the group", then that member will be the only one that gets credit.
- The names of all the group members that attended the lab and worked on the report must appear on every submitted copy of the report. **The names of absent students cannot be included in the report.** Doing so constitutes academic dishonesty, and every group member will be reported to OSSJA.
- **All lab reports must be submitted to Canvas before leaving the lab classroom.** The original lab report cannot be completed at home – only fixes to unacceptable submissions (see below) can be completed away from the lab.

#### re-submitting a report

- If you submit a report that is graded as "unacceptable" by the TA (an ✗ appears in Canvas, and the TA will write a short note in the grading indicating what part(s) of your report are inadequate), then you are required to repair and resubmit that report.
- Group members can confer about how to fix the problems, but everyone is *individually* responsible for making the fixes. That is, a group member submitting a fix for themselves does not count toward a fix for every other group member.
- Re-submissions are made in the same place in Canvas as the original lab report.

#### make-up labs

You can only make up a lab attendance with a **verifiable emergency** – there is no "remote option" for labs, and you cannot simply choose to show up to a lab section that you prefer. The whole point to a lab component is being present to "get your hands dirty" and work with other students. While we have ways for you to make up lab reports if an emergency forces you to miss all available lab meetings for that week, this is only an extreme measure, not merely an option for you to choose. Missing more than two lab meetings for the quarter – *no matter how dire the circumstances* – will impact your grade, even when you do the make-up reports for those labs. Here are the details related to not attending the scheduled lab session – read them carefully!

- You *must* contact your TA (not the lecture instructor!) to let them know why you have missed or will miss a lab meeting.
- You must make your best effort to come to another lab meeting, to work with a group in-class. The schedule of lab meeting times is posted on the [Physics 9B Lab Web Page](#). If you have a choice of make-up lab meetings to attend, you should try to attend one taught by your usual TA, but that is not necessary. Whoever the TA is that you attend a make-up lab with, you need to check-in with them and tell them who you are, so that they can give you credit for being there.
- If you cannot attend a make-up lab session, then assuming you have satisfied your TA about the reason for your absence, they will give you "make-up data" for that lab. This is data that has been collected for you to use for analysis, and you write a lab report as though this was what your group measured. ***This report is all yours to write – you may not use the data acquired by your usual group, nor can you use their lab report. If you try to turn in a lab report for which you were not present, you will be reported to the OSSJA for academic misconduct – no exceptions!***
- All of the lab TAs hold weekly office hours, and are available to help you understand what you need to do to write this report.
- Note that it is possible to receive an "unacceptable" grade for a lab report written with make-up data, and in that case, you will need to make revisions, as usual.

## IV. Lab Grading

Each lab comes with three grades in Canvas: one for the pre-lab quiz, one for attending the lab session, and one for submitting a lab report. The table below describes what each grade means, and the consequences to your lab grade if those grades persist to the end of the quarter. In every case, *communication with your lab TA is key!*

grade	attendance	lab report
<b>Excused</b>	<ul style="list-style-type: none"> <li>missed scheduled lab session due to a verifiable emergency</li> </ul> AND <ul style="list-style-type: none"> <li>submitted lab report after attending another lab section or used makeup data</li> </ul>	<ul style="list-style-type: none"> <li>not a possible grade for the lab report – <i><b>you cannot be excused from writing a lab report</b></i></li> </ul>
×	<ul style="list-style-type: none"> <li>missed scheduled lab session</li> </ul> AND <ul style="list-style-type: none"> <li>not eligible for <b>Excused</b> (not verified emergency, or used 2 of these already)</li> </ul>	<ul style="list-style-type: none"> <li>unacceptable lab report submitted – communicate with lab TA to find out how it can be fixed and resubmit to change this grade</li> </ul>
✓	<ul style="list-style-type: none"> <li>attended lab session and participated</li> </ul>	<ul style="list-style-type: none"> <li>acceptable lab report submitted or resubmitted</li> </ul>
end-of-quarter consequences		
grade	attendance	lab report
high pass eligible	0 or 1 <b>Excused</b>	all lab reports submitted <i>and</i> acceptable (✓)
pass	no more than 2 <b>Excused</b>	all lab reports submitted <i>and</i> no more than 1 unacceptable (×)
low pass	1 unexcused (×) or 3 <b>Excused</b>	1 lab not submitted or 2 unacceptable (×)
no pass	more than 1 unexcused (×) or more than 3 <b>Excused</b>	2 or more labs not submitted or 1 lab not submitted with 2 unacceptable (×) or 3 or more unacceptable (×)
<b>Note:</b> "High pass eligible" only means that the TA is allowed to consider you for a possible high pass grade – it does not mean that you receive this grade for qualifying.		

**Important note: The time available for fixing blank and unacceptable grades is not unlimited.** Your TA will let you know how long you have to do a make-up lab report during the quarter (they may limit you to one or two weeks, for example). But there is an absolute deadline at the end of the quarter beyond which you cannot go – even asking your TA for an extension will not help. This deadline is 11:59pm of the last day of the quarter, and you will not be able to submit after this time. The time you have for makeups is more than generous – if you manage to not get it in by the final deadline, don't even bother to ask for more time, it won't be granted.

## V. Overall Lab Grades

At the end of the quarter, you will receive one of four grades for the lab portion of the course, and these grades come with different consequences for your course grade.

**HP High Pass** – A very small percentage of students will receive this grade. It is reserved for the few individual students that the TA feels have done an exceptional job – it is not a grade given to entire groups. See the table above for grades that automatically disqualify someone from this grade. The overall course grade consequence of receiving a lab grade of HP is an **increase of one-half letter grade** (such as B– to B). The only exceptions to this are changes from F→D– and A→A+.

**P Pass** – Almost everyone in the class receives this grade. See the table above for requirements for this grade. Given the opportunities to fix a lab grade, this should not be a problem, but you must keep close tabs on your lab grades so that these don't catch you by surprise. This lab grade has **no effect on the overall course grade**.

**LP Low Pass** – These are pretty rare, and there is no reason why everyone shouldn't be able to avoid them altogether. See the table above for what leads to this grade. The overall grade consequence of receiving a lab grade of LP is a **decrease of one-half letter grade** (such as B+ to B).

**NP No Pass** – See the table above for what leads to this grade. The overall grade consequence of receiving a lab grade of NP is that **you receive an F for the full course**, regardless of your performance outside of lab.