General Student Information for Physics Labs

Physics is fundamentally an experimental science. Theories developed by physicists are considered valid only when they are confirmed by experiment. The eight experiments that you will perform this quarter are designed to help you better understand the concepts taught in the lecture, to give you an experiential approach to topics that have been covered only theoretically in lecture, and also to provide an experience that teaches how experiments are performed and how data are analyzed. This document describes the policies and procedures that will be observed during the quarter. Please read and understand it before beginning your laboratory course.

Instructor and Staff

The instructor is responsible for scheduling, the content of the lab course, setting policy, writing the laboratory skills assessment, and assignment of the letter grades.

Academic Coordinator, primary lab manager:
Dr. Jonathan Eldridge
e-mail: jonathan.eldridge@ucr.edu
office: Bottom of Office Suite in Gather Town
phone: (951) 827-5370

Instructor in charge:
Dr. Michael Anderson
e-mail: michaelg.anderson@ucr.edu
office: Physics 3013
phone: (951) 827-5370

The laboratory staff is responsible for setting up the labs and maintaining the laboratory equipment.

Technical Staff Contact:
David Neff
e-mail: david.neff@ucr.edu
office: Physics 2004
phone: (951) 827-5637

iLearn

The lab manuals, your scores, and other information will be available on iLearn at ilearn.ucr.edu. If you have issues accessing your section’s iLearn page, send an email to Jonathan.eldridge@ucr.edu.
Laboratory Schedule

There will be eight Physics labs, plus a “lab zero.” Labs will begin on Tuesday, March 30, and end on Friday, June 4, 2021. You will be given an assessment during your normally scheduled lab period in the tenth week of classes: Tuesday, June 1 through Friday, June 4. Refer to the chart below for the specific lab schedule:

<table>
<thead>
<tr>
<th>Lab #</th>
<th>Topic</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>See Class specific Schedule</td>
<td>4/13/2021</td>
<td>4/14/2021</td>
<td>4/15/2021</td>
<td>4/16/2021</td>
</tr>
<tr>
<td>7</td>
<td>See Class specific Schedule</td>
<td>5/18/2021</td>
<td>5/19/2021</td>
<td>5/20/2021</td>
<td>5/21/2021</td>
</tr>
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</table>


Laboratory Attendance and Absence Protocol

You are required to attend the lab section in which you are enrolled. You will not be allowed to complete any labs by attending a different lab section than the one in which you are enrolled.

Laboratory attendance is mandatory. All pre-lab assignments are due at the start of the lab period (the TA will tell you their preferred online submission method). Important information about each experiment is presented at the beginning of the session. Quizzes are then given during the first part of the lab and will not be repeated.

Makeup labs are not possible, but missed labs may be excused for illness or other exceptional circumstances. If you are unable to attend your regularly scheduled lab, you will need to file an “excused absence request form” (the form may be found on your iLearn page). The completed form and associated materials should be submitted well in advance of any lab that you plan to miss. If the absence is unplanned, such as in the case of an emergency medical issue, you must turn in the form and materials within 48 hours of the end of the scheduled class. With the completed form, you must submit the following via email to the instructor in charge:

- The original copy of any relevant documentation, such as a doctor’s note.
- The pre-lab assignment that was due for the lab period that you missed.

Upon receipt of the above, the instructor in charge will notify you via e-mail upon receipt of this request. A student with an excused absence should consult their TA and other classmates for the technical information from the excused lab and copy it into their notebook, as this material will be needed in the lab final exam.

Please note: Filing a request for an excused absence does not guarantee that it will be accepted. Excuses for medical appointments, funerals, accidents, and educational conferences are usually approved. It is extremely unlikely, however, that more than one excused absence would be granted in a given quarter, as any absence means that you miss critical information.
Laboratory Conduct

**Be Prepared:** It is very important that you read the lab manual ahead of time and understand the physics involved in each experiment. The lab manuals are currently available on iLearn. You are responsible for having access to the lab manuals, notebooks, pens, calculators, and other general supplies while you are conducting the lab session.

**Pre-Lab Assignments:** Each lab has a pre-lab assignment that must be completed before class and submitted to the TA at the beginning of the lab section (the TA will tell you their preferred online submission method).

**Quizzes:** Quizzes are intended to be a measure of how well prepared you are for the upcoming laboratory. Quizzes are then given during the first part of the lab and will not be repeated.

**Start and Finish on Time:** Even though the labs are being conducted online this quarter, it is in everyone’s best interest to keep the time’s as synchronous as possible. The labs are designed for you to have time to finish all of the activities in the given time and submit the materials in the given time period.

**Online Resources:** As we are conducting labs online this quarter, you will need to access many types of computer programs. When you are running these labs, a PC or Mac is required as an iPad or other tablet may run some but not all of the necessary programs. Students can apply for resources if they cannot meet this requirement. For more information on this, please contact our Lab Manager David Neff (david.neff@ucr.edu)

We are doing our best to make this process as simple as possible, but there will be some things you will need in order to access them. For example, you will most likely have to access the Colorado PhETs during this quarter and some of them require JAVA. For this we suggest you download JAVA; a full list of Java distributions can be found here: [https://www.java.com/en/download/manual.jsp](https://www.java.com/en/download/manual.jsp). But that is just one example of things that might pop up during the quarter. Our suggestion is that you read the lab manual a few days before your lab session and attempt to start whatever online simulation or other online resource is being used that day. This way if you do indeed have problems you can let your TA know at the beginning of the lab session.

**Graph Creation:** You will be analyzing data during every lab session. Most labs will require you to create a graph. You are required to have a way to create graphs. Excel is the program that we are strongly suggesting to use, as it is used widely in most professional settings and it is free for UCR students ([https://cnc.ucr.edu/iguide/office365.html](https://cnc.ucr.edu/iguide/office365.html)).

**Laboratory Notebooks**

You are responsible for maintaining a comprehensive laboratory notebook for this course. The objective is to have a record of the experiment to which you or others can refer at a later date. A lab notebook is a working document that should contain a detailed and complete record of all the work performed and accurately reflect what actually occurred in the lab experiments. The writing quality of the presentation in the notebook is less important than making sure that the information in the notebook is complete, descriptive, and precise.

You are required to keep all of the information that you collect in this lab in a notebook. A used notebook of this style is acceptable if there are at least 40 blank pages. In this case, all pages used for work other than Physics labs must be removed.
In general, lab manuals provide prompts for all the information that is necessary for your lab reports. Use the following criteria to prepare lab reports that will be most useful for your future reference:

- **Purpose:** This is a general introduction at the beginning of the report that states the lab objectives. It is useful for organizing your thoughts when you refer to your notebook later.
- **Description of Apparatus and Procedure:** Write down what measurements you will take and how you will take them, in case you are asked to replicate the experimental procedure at a later date. Labeled diagrams are always an effective way of documenting an experimental set-up.
- **Data Collection:** All graphs, tables, or diagrams generated by the computer must be attached to the lab notebook pages and to the copies that you turn in.
- **Overall Look:** Your lab notebook must be well-organized. It is a “working” notebook, so crossed-out words and sections are acceptable (nobody’s perfect…). Your work needs to be understandable by a third party, however, so your handwriting must be legible, the organization clear, and the overall look professional.

When you are finished with the experiment, you are to create a pdf document of your lab to submit, to the TA (again the TA will advise you as to the best way to submit this report). Your report will be reviewed by your TA and delivered back by the start of the following week’s lab with a numerical score and feedback.

The comments will address issues such as: Are the descriptions of the experiment and the data set complete? Are the data accurate and precise? Are the calculations and error analysis complete and correct? Are your descriptions, explanations, and analysis thoughtful and informed by your experiment?

You are strongly encouraged to review the TA’s comments and correct any deficiencies on your original notebook. Correcting your notebook will help you with the lab skills assessment.

The numerical grade will be between ‘0’ and ‘3’. A ‘3’ will be given if the lab report is complete and accurate with enough information to write a comprehensive paper on the experiment, a ‘2’ will be given if there are some significant errors, a ‘1’ will be given if information is missing or incorrect, and ‘0’ will be given if minimal effort was put in. You will not be evaluated on the presentation, having complete sentences, nor your syntax, provided that the grader can easily parse the information you recorded. Labeled diagrams are often an effective way of documenting any experiment or description. In many instances where you are asked to think about and describe hypothetical situations, you will be typically scored more on your thoughtfulness and your scientific analysis rather than on your explicit correctness.

**NOTE ON GRADES:** All current lab grades will be posted to iLearn by your TA. It is the student’s responsibility to check iLearn to make sure that their own grades are correct. If there are any errors, the student must contact their TA, preferably during the next lab session to resolve the problem. All posted scores become final two weeks after they are posted.

**Lab Skills Assessment**

You will be given a lab skills assessment during your normally scheduled lab period in the tenth week of classes (June 1 – June 4). The purpose of this assessment is twofold: 1) It is intended to judge the extent of your learning throughout the lab course, and 2) the assessment is needed to compare grades across different lab sections that have been graded according to standards established by different TAs. Details about the assessment will be posted on your iLearn page no later than February 16th.

The assessment is a sixty-minute multiple-choice test with questions on the experiments that you performed during the quarter. You may be asked questions about each lab along five descriptive categories: conceptual, calculation, experiment perturbation, graphical analysis, and uncertainty analysis.
The only aids you are allowed to use during the assessment are your lab notebook(s) and a calculator. The more complete and comprehensive your notebook is, the more useful it will be during the assessment. You will not be allowed to bring the lab manuals, any books, any photocopied material, another person’s notebook, or even the notebook pages you turned in with the TA’s comments.

**Grading Policy**

Your grade for this class will be based on your lab reports, pre-lab assignments, quizzes, and the skills assessment. It is your responsibility to verify that all scores have been correctly entered into iLearn. If error(s) are found, contact your TA and/or the course instructor immediately.

The total score for the course grade will be calculated with the following weights and note that your lowest lab score (pre-lab + quiz + report) will be dropped from your final grade at the end of the term.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab Reports (0-3 points each)</td>
<td>30%</td>
</tr>
<tr>
<td>In-Class Quizzes (0-2 points)</td>
<td>20%</td>
</tr>
<tr>
<td>Pre-Lab Assignments (0-1</td>
<td>10%</td>
</tr>
<tr>
<td>Lab Skills Assessment</td>
<td>40%</td>
</tr>
</tbody>
</table>

The raw scores, determined from a normalization of the total score for the lab reports, quizzes, and pre-labs within your section in combination with your lab skills assessment score, will be modestly curved.

If you are taking 2LA, 2LB, or 2LC, your final letter grade in lab will be determined from the above calculation. Your lab letter grade will be separate from your lecture letter grade.

If you are taking the lab components of 40A, 40B, or 40C, your final lab score will be submitted to your lecture professor and incorporated into your final lecture letter grade. Consult your lecture professor if you have issues with your final letter grade.

A note about this document. This is a generic form of the syllabus for PHYS 40 and 2 series labs. A version more accurate to your lab should be available on iLearn.