General Student Information for Physics 40C 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 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
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Instructor in charge:

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Technical Staff:

General Contact:
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David Neff (Technical Staff Supervisor)
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The laboratory technical staff is responsible for setting up the labs and maintaining the laboratory equipment.

eLearn

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

Laboratory Schedule

There will be eight Physics labs. Labs will begin on Tuesday, September 28, 2021 and end on Friday, December 3, 2021. There will be no labs the week of Thanksgiving (November 23 through 26). You will be given an assessment during your normally scheduled lab period during the last week of lab on November 30 through December 3. Refer to the chart below for the specific lab schedule:

Lab #	Topic	Date			
		Tuesdays	**Wednesdays**	**Thursdays**	**Fridays**
1	Electrostatics and Circuits	9/28/2021	9/29/2021	9/30/2021	10/1/2021
2	Electricity Generation	10/5/2021	10/6/2021	10/7/2021	10/8/2021
3	Equipotential Mapping	10/12/2021	10/13/2021	10/14/2021	10/15/2021
4	Capacitors	10/19/2021	10/20/2021	10/21/2021	10/22/2021
5	DC Electrical Circuits	10/26/202	10/27/2021	10/28/2021	10/29/2021
6	Neuronal Circuitry	11/2/2021	11/3/2021	11/4/2021	11/5/2021
7	Magnetic Force on a Current (simulation)	11/9/2021	11/10/2021	**Veterans Day** 11/11/2021	11/12/2021
8	Self-Inductance and AC Circuits	11/16/2021	11/17/2021	11/18/2021	11/19/2021
Lab Skills Assessment		**11/30/2021**	**12/1/2021**	**12/2/2021**	**12/3/2021**

Veterans Day, November 11, falls on a lab day this year. All sections will perform lab remotely by simulation that week. A link to the simulation(s) will be available in your lab manual. You will receive more details and instructions as the day draws closer.

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 section other than the one in which you are enrolled.

Laboratory attendance is mandatory, and you must arrive on time. All pre-lab assignments are due at the start of the lab period. 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 eLearn 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 Dr. Eldridge:

- 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 Skills Assessment.

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 eLearn. You are responsible for bringing lab manuals, notebooks, pens, calculators, and other general supplies to the lab.

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 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: 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. **If you are more than 30 minutes late you will not be allowed to preform the lab and will be given a zero.**

Clean-Up of your Workstation: At the end of each lab, return any checked-out equipment and clean up your area. Report any malfunctioning equipment immediately to your TA. **Failure to**

properly reset your workstation can result in hazardous conditions. As such, your TA may deduct points from your lab report if you do not properly clean-up your workstation.

Safety: Many aspects of laboratory work have some degree of hazard and potential for injury. Our labs are all designed to be safe, but you must obey all instructions regarding lab safety. Use common sense when handling equipment, and be careful around AC outlets, sharp corners, slippery floors, and other obvious hazards. You will be given specific instructions concerning safety for unusual experiments. Any personal protective equipment needed (e.g. lab coats, goggles, etc.) will be supplied for you.

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.

At the end of each session, remove the carbon copies of the notebook pages for that day's work, attach any printed data (eg. graphs and tables) to the copies and the originals in your notebook with glue, tape, or staples, and turn in the stapled copy to the TA. Your report will

be reviewed by your TA and handed back at the start of the following week's lab with a numerical score and written 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.

Lab Skills Assessment

You will be given a lab skills assessment during your normally scheduled lab period in the tenth week of classes. 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 eLearn page towards the end of the quarter.

The assessment is a sixty-minute test with questions based on the experiments that you performed during the quarter. You may be asked questions about each lab along six descriptive categories: lab notebook, conceptual, calculation, experiment perturbation, graphical analysis, and uncertainty analysis. Details about these categories will be available on a study guide later in the quarter.

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 that have a TA's comments.

Grading Policy

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

NOTE ON GRADES: All current lab grades will be posted to eLearn by your TA. It is the student's responsibility to check eLearn 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 scores posted to eLearn become final two weeks after they are posted. Once grades have been submitted to the registrar, no changes will be allowed.*

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.

- Lab Reports (0-3 points for each lab): 30%
- In-Class Quizzes (0-2 points for each lab): 20%
- Pre-Lab Assignments (0-1 points for each lab): 10%
- Lab Skills Assessment (0-16 points): 40%

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 and forwarded (as a number) to the faculty in charge of the lecture component of this course. Contact the lecture instructor with any questions concerning your final letter grade.