Orientation for University of Nevada Undergraduate Physics Labs

Class Description and Objectives

The purpose of the physics laboratory is to allow students to witness the concepts and physical laws that are introduced in lecture. You will also be exposed to elementary laboratory techniques. Every class will have a short lecture introducing the procedures, concepts, formulas and instructions relevant to the experiment. The lecture will also cover what is expected in your lab-report; don’t be late. Attendance and participation is mandatory. Experiments will usually be performed in groups, but each student will turn in an individual lab report.

Student Learning Outcomes

This course is designed to provide practical experience necessary for a well-rounded understanding of the physical world. Students that successfully complete this course should be able to:

- Demonstrate problem-solving skills for various physical problems using quantitative reasoning, critical thinking, and appropriate mathematical techniques.

- Identify physical concepts in their everyday experience.

- Demonstrate skills in the collection and interpretation of data from laboratory experiments.

- Properly use: scales, calipers, digital voltmeters, micrometers, and balances.

- Develop habits and practices that minimize uncertainty in physical measurements.

- Properly propagate errors and uncertainties.

- Understand and use significant figures.

- Fit experimental data to a given mathematical model.

- Demonstrate proficiency in troubleshooting and interpreting physical measurements.

- Develop effective communications skills to ensure accurate transfer of technical information.
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Topics and material covered in lab will not always coincide with the lecture. In such cases, you will be expected to do outside reading in order to be prepared for the lab.

For more information about the Department of Physics and Student Labs, please visit: physics student-resources and labs.

What Is Required For Lab

- This lab notebook, which is designed to help you succeed in your labs and includes the appropriate number of carbonless graph pages.
- A copy of the lab to be performed. Each week’s lab can be downloaded from the physics department website: Physics student resources and labs.
- A completed pre-lab, entered in your notebook, in pen. Instructors will check that the pre-lab is complete.
- A pen.
- A calculator.

Lab Session Format

Each lab session will start with a short lecture given by the instructor. The lecture will cover both the physics and the instructions involved in performing the lab experiment. Please arrive ready to do the lab or having prepared questions about performing the lab. During the lab, the instructor will come by to monitor your progress and check that the pre-lab is complete. Lab sessions are only 110 minutes long, so you need to arrive prepared to perform the lab. Lab sessions are scheduled back to back, so it is not possible to stay late to complete a lab. Lab reports will be collected at the end of each session. Incomplete lab reports will be given partial credit.

Attendance

You are required to attend all classes. If you must miss a lab, you should arrange to make up the lab by attending a different lab session during the same week of your absence. You must contact both your instructor as well as the other instructor before attending a different lab section. Instructor contact information can be found on the Department of Physics website: physics student resources and labs. No more than three
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labs may be made up in another section. Missing or failing to turn in three or more lab reports almost always results in a failing grade for the lab class.

Lab reports that are turned in for experiments which you did not attend/perform will be given a grade of zero. There are no mulligans, rewrites, or do-overs. You are expected to be in class (in body and mind) on time.

Lab Etiquette

- No eating or drinking is allowed during the lab.
- Please turn off your cell phone.
- You and your partners must clean up and shut off equipment after you are finished. Failing to leave your station complete, organized, and working can affect your grade.
- Please report all damaged equipment so it can be replaced.
- Arriving late to lab or other disruptive behavior can result in a 10% reduction in the grade of your lab report.

Laboratory Safety

Lab work can expose one to various kinds of hazards (e.g., electric shocks, burns, cuts, defenestration); every person working in the laboratory should maintain a “situational awareness” of their surroundings, so as to avoid possible injury. Be aware and reduce the risk of injury and/or damaging the equipment. Report any accident immediately.

Worst lab accidents in history

The Ground Rules

- Students are allowed to drop their lowest lab grade. For example, if ten labs are performed during the semester, the T.A. will use the nine best lab grades to calculate a student’s final grade.

- Students that must miss their assigned lab section can arrange to take the lab in a different lab section (during the same week) if the student receives permission from both T.A.s. It is the student’s responsibility to make arrangements to turn in their lab report to their normal TA.
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• Labs that are missed due to an excused absence (school duty, school event…) will be waived with no penalty to the student, provide the student supplies proof that absence was excused.

• Labs reports are due at the end of each class period. Students that complete labs outside their normally scheduled lab section must make prearrangements with their regular TA to turn in their report (see above). Late labs are not accepted.

• Make sure you know where your TA’s mailbox is located!! The department cannot guarantee that anything, placed in the wrong mailbox or some other “novel” location, will make it to the proper instructor for grading.

• You are expected to read the lab experiments before class and have a copy of the lab with you in the class.

• Students will keep and maintain an individual lab notebook. All notebook entries must be in ink.

Grading and Format of Lab Reports

All lab reports are to be handwritten in pen in your notebook. No other format will be accepted. At the end of each lab session, you will turn in the original report to your instructor and retain the carbon copy in your notebook.

All data and sample calculations must be entered legibly in your notebook in pen. Hand drawn graphs must be legible and labeled. Questions must be answered in complete sentences. All labs will be graded according to the grading rubric.

The objective and theory section of your lab report needs to be completed prior to class.

Your original data must be recorded in your lab notebook; it is the student’s responsibility to make sure that the original data is signed or initialed by the instructor before leaving the lab. This signature will be counted as attendance. Lack of signature on original data is grounds for a grade of zero.

Lab reports are due at the end of each class period. Students will turn in individual reports.

Lab reports are due at the end of the class period; late labs will not be accepted without good cause and prior permission from the instructor.

Lab reports that contain copied and or plagiarized material will be given a zero. Lab reports that are not written in your own words will be given a zero. Lab reports for lab experiments the student did not perform will be given a zero.
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The first lab report that contains copied or plagiarized material will be given a grade of zero. The second occurrence will drop your final grade by one letter grade. The third lab that contains copied or plagiarized material will result in an F for the class.

Neatly hand-written lab reports are accepted. Illegible lab reports are unacceptable and will be given a grade of zero.

Follow the grading rubric when writing up lab reports. This format can be found on the next page and on the Department of Physics website. Lab reports that do not follow the rubric will be graded down.

Format of Lab Reports and Grading

Name:
Lab Partner’s Name:
TA’s Name:
Date:

Title of the Experiment
(1 point or 2% for proper heading)

Objective (2 points, or 4%): A concise statement (a sentence or two, in your own words*) that summarizes the objective of the experiment. This section must be completed prior to class.

Theory (8 points, or 16%): Summarize, in your own words*, the theory of the physics involved in the experiment (a couple of paragraphs), as well as an outline of the procedures. Explain, in your own words*, any significant terms you find in the lab manual. This section must be completed prior to class.

4 points for summarizing the theory
4 points for outlining procedures

Pre-lab question (2 points): For some lab experiments there are pre-lab questions. The answers to these questions are to be turned in with your pre-lab. Each correct answer to a pre-lab question is worth 2 points

Notes and Computations (3 points, or 6%): You should be recording notes from the lab lecture in your notebook, as well as any observations or questions you have. Any calculations should also appear in your notebook. Think of these notes as a reference for you to look back at. Record what you think will help you recall the experiment. You are
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free to use any note structure that works for you, but keep it neat and legible. Though this
is not necessarily a contiguous “section,” these notes should be clearly separated from,
and not mixed in, any other section.

Equations (2 points, or 4%): Present the key working equations. Define all variables
and provide their units.

1 point for expressing relevant equations
1 point for defining variables and proper units

Data (10 points, or 18%): An orderly display of the data, preferably in tabular form.
The TA must sign your original data. All entries should be clearly identified and
include their proper units.

2 points for a data section
2 points for original data (signed by instructor)
2 points for proper/clear labeling of data
2 points for proper units of data
2 points for numerical results

Questions (25 points, or 50%): There are typically five questions at the end of each lab.
Each correctly answered question is worth 5 points.

Grade = (total points earned / total points available) X 100

Note: Your instructor will consider the above format when grading your lab report. The
following may also be taken into consideration (Worth ≈ 10%):

1. Neatness
2. Composition
3. Grammar
4. Spelling
5. Thought and originality in performing and presenting the lab
6. Behavior that is disruptive to the labs (which includes, but is not limited to, being late
to class or not leaving a clean work area for the following class)
7. Ability to follow instructions

In your own words*: this means in your own words! Labs that contain material copied
or plagiarized from the lab instruction or elsewhere will be given a grade of zero.

Not all labs will conform exactly to the lab report format given above. Some labs may
not require a certain section of the lab format, while another lab may require an additional
section be added to the write-up. For nonconforming labs, check with the instructor as to
what they expect for a write up.
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A bonus point will be given to those finding and reporting errors in lab the manual and or lab instructions.

Statement on Academic Dishonesty

"Cheating, plagiarism or otherwise obtaining grades under false pretenses" constitutes academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated, and penalties can include canceling a student's enrollment without a grade, or giving an F for the course or for the assignment. For more details, see the University of Nevada, Reno General Catalog.

Adding or Changing Lab Sections

Students can only be added (or swap) into lab sections that are not full. Lab capacity is set by fire code. Under no circumstances will a student be allowed to join a full lab section, so please do not even ask. During the first week of the semester, students will able to add/drop themselves by using MyNevada. During the second week, students need the Lab Director’s permission to drop/add. Before making any requests, please make sure the section you desire is open. Along with your request, the lab director will need your student I.D. number, the section number of the lab you are joining (or adding), as well as the section number you are leaving. Once lab classes have begun, no late adding will be allowed. It is possible to change lab sections during the semester, but only for good cause and pending Lab Director’s permission.
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Grading and percentage of total reports:
A: 90 -100  B: 80 – 89  C: 70 – 79  D: 60 – 69  F: Below 60

Disability Statement: Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the Disability Resource Center (Thompson Building Suite 101) as soon as possible to arrange for appropriate accommodations.

Academic Success Services: Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring/), and University Writing Center (784-6030 or www.unr.edu/writing_center). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

Statement on Academic Dishonesty: For example, "Cheating, plagiarism or otherwise obtaining grades under false pretenses" constitute academic dishonesty according to the code of this university. Academic dishonesty will not be tolerated and penalties can include canceling a student's enrollment without a grade, giving an F for the course or for the assignment. For more details, see the University of Nevada, Reno General Catalog.

Statement on Audio and Video Recording: Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.
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4 points for summarizing the theory
4 points for outlining procedures

Notes and Computations (3 points or 6%): You should be recording notes from the discussion before the experiment, as well as any observations or questions you have. Any calculations should also appear in your notebook. Think of these notes as a reference for you to look back at. Record what will help you later and structure it however works best for you, but keep them neat and legible. Though this is not necessarily a contiguous “section,” these notes should be clearly separated from and not mixed in any other section.

Equations (2 points or 4%): Present the key/working equations. Define all variables and provide their units.

1 point for expressing relevant equations
1 point for defining variables and proper units

Data (9 points or 18%): An orderly display of the data, preferably in tabular form. Your original data sheet must be signed by the TA. All entries should be clearly identified and include their proper units.

1 points for a data section
2 points original data (signed by instructor)
2 points for proper/clear labeling of data
2 points for proper units of data
2 points for numerical results
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Questions (25 points or 50%): There are typically five questions each correctly answered question is worth 5 points

Grade = (total points earned / total point available) X 100

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