Physics 180L (1007) - Engineering Physics Lab
Fall – 2018
Course Syllabus

1. Course Information

General Information:

Instructor: Aidan Klemmer
Email: aidan@nevada.unr.edu
Office: Leifson Physics (LP) 107
Mail box: 2nd Floor LP (see page 5)

Office hours: Friday 10 – 11AM (and by appointment)
Lab meeting time: Thursday 1PM – 3PM
Lab manuals webpage: http://www.unr.edu/physics/student-resources/fall-2018-labs

Class Description and Objectives:

For physical science and engineering majors. Vectors, one and two-dimensional kinematics, particle dynamics, work and energy, momentum, rotational mechanics, oscillations, gravitation, fluids, elastic waves and sound.

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.

Course Prerequisites:

Pre-Requisite: MATH 181
Co-Requisite: PHYS 180

Student Learning Outcomes:

The purpose of the course is to provide the practical knowledge necessary for a well-rounded understanding of the physical world. This laboratory experience partially satisfies the Silver Core Objective CO4: Physical & Natural Phenomena. Students that successfully complete this course should be able to:
i. The student will demonstrate problem solving skills in various types of problems in physics using quantitative reasoning, critical thinking and appropriate mathematical techniques.

ii. The student will demonstrate the ability of use scientific methods to understand and explain concepts in physics.

iii. The student will be able to connect physics concepts and problems to their world experience.

iv. The student will demonstrate skills in collection and interpretation of data from laboratory experiments.

v. Properly use and read: scales, calipers, digital voltmeters, micrometer and balances.

vi. Develop proper habits that minimize uncertainty in physical measurements.

vii. Set up and solve problems related to the propagation of errors and uncertainties.

viii. Understand and properly use significant figures.

ix. Plot and fit experimental data to a given mathematical model.

x. Proficiency in troubleshooting, problem-solving and interpreting the results of physical measurements.

xi. Develop effective written and verbal communications skills to ensure accurate transfer of technical information.

Course Requirements:

Physics lab notebook (found at the Wolf Shop bookstore) and copy of the guide for each lab to be performed (found at https://www.unr.edu/physics/student-resources).

2. Course Evaluation

General Rules:

- In the last 30 minutes of the lab time you will: complete the conclusion questions, clean up the experiment, turn off equipment, and have the TA sign off your data.
- You are expected to read the lab guides before class and have a copy with you in class.
- You will keep and maintain an individual lab notebook. All notebook entries must be in ink.
- Lab reports are due at the end of each class period. Late labs are not accepted.
- Attendance is required. 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 TAs. See Section 3 for further information. Students that complete labs outside their normally scheduled lab section must make prearrangements with their regular TA to turn in their report.
• 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. See Section 5 for further information.
• You are allowed to drop your lowest lab grade. For example, if ten labs are performed during the semester, the TA will use the nine best lab grades to calculate your final grade.

Lab Reports:

• The objective and theory sections of your lab report must be completed prior to class. If there is anything you don’t understand, just ask – send an email, take advantage of office hours, or visit the Physics Help Center in LP 209 (for current hours, see https://www.unr.edu/physics/student-resources/physics-help).
• Your original data must be recorded in your lab notebook. It is your 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. Late labs will not be accepted without good cause and prior permission from the instructor. Lab reports for experiments the student did not perform will be given a zero.
• Lab reports that contain copied and or plagiarized material (i.e. that are not written in your own words) will be given a zero. 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 full letter grade. The third lab that contains copied or plagiarized material will result in you failing the class.
• Neatly handwritten lab reports are accepted. Illegible lab reports are unacceptable and will be given a grade of zero.
• Follow the rubric when writing up lab reports. This format can be found on the lab manual website. Lab reports that do not follow the rubric will be graded down.

Grading Scale:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-94</td>
<td>A</td>
</tr>
<tr>
<td>93-90</td>
<td>A-</td>
</tr>
<tr>
<td>89-87</td>
<td>B+</td>
</tr>
<tr>
<td>86-83</td>
<td>B</td>
</tr>
<tr>
<td>82-80</td>
<td>B-</td>
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<tr>
<td>79-77</td>
<td>C+</td>
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<tr>
<td>76-73</td>
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<td>C-</td>
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<tr>
<td>69-67</td>
<td>D+</td>
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</tr>
<tr>
<td>62-60</td>
<td>D-</td>
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<tr>
<td>60-0</td>
<td>F</td>
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</tbody>
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3. Attendance, Safety, and Etiquette:

Attendance:

You are required to attend all lab sessions, and you are expected to be in class on time. There are no do-overs, so make each lab session count. If you must miss a lab due to a justifiable excuse (documented illness, emergency, court date, etc.), you should arrange to make-up the lab during a different lab section within the same week (the week of your
absence). It is recommended that you pre-arrange your absence and make-up lab to the greatest extent possible. You must contact both instructors before attending another lab section. No more than three labs may be made up in another section. **If you fail to turn in three or more lab reports you will receive a failing grade for the class.** Lab reports turned in for experiments which you did not attend/perform will be given a grade of zero.

**Lab safety:**

Experimental work can expose one to various kinds of hazards (electric shocks, burns, cuts, etc.). Every person working in the laboratory should maintain *situational awareness* to reduce the risk of injury and/or damage to equipment. Stay alert and report any accidents immediately.

To see some examples of the importance of lab safety, visit [http://www.realclearscience.com/lists/worst_lab_accidents_in_history/](http://www.realclearscience.com/lists/worst_lab_accidents_in_history/).

**Lab Etiquette:**

- No eating, drinking, smoking, or applying cosmetics in the lab room.
- Please turn off your cell phone.
- You and your lab partners must shut off and clean up equipment after you are finished with your lab. Failing to leave your station complete, organized, and working can affect your grade.
- Please report all damaged equipment so it can be replaced.

**Schedule:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Experiment</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 September</td>
<td>Orientation</td>
<td>DMS 212</td>
</tr>
<tr>
<td>10 September</td>
<td>Normal Distribution</td>
<td>DMS 212</td>
</tr>
<tr>
<td>17 September</td>
<td>Understanding Motion I &amp; II</td>
<td>DMS 212</td>
</tr>
<tr>
<td>24 September</td>
<td>Force Table</td>
<td>DMS 208</td>
</tr>
<tr>
<td>1 October</td>
<td>Acceleration on an Air Track</td>
<td>DMS 212</td>
</tr>
<tr>
<td>8 October</td>
<td>Scalar Product</td>
<td>DMS 208</td>
</tr>
<tr>
<td>15 October</td>
<td>Conservation of Momentum</td>
<td>DMS 212</td>
</tr>
<tr>
<td>22 October</td>
<td>NO LABS</td>
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</tr>
<tr>
<td>29 October</td>
<td>Uniform Circular Motion</td>
<td>DMS 210</td>
</tr>
<tr>
<td>5 November</td>
<td>Torque</td>
<td>DMS 212</td>
</tr>
<tr>
<td>12 November</td>
<td>Rotational Kinetic Energy</td>
<td>DMS 212</td>
</tr>
<tr>
<td>19 November</td>
<td>NO LABS</td>
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</tr>
<tr>
<td>26 November</td>
<td>Standing Wave in Air</td>
<td>DMS 212</td>
</tr>
<tr>
<td>3 December</td>
<td>NO LABS</td>
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</table>
4. University Policies

Class Absence Policy:

The university’s absence policy is found at http://www.unr.edu/administrative-manual/3000-3999-students/3020-class-absence-policy.

Disability Statement:

The Department of Physics and the University of Nevada, Reno support providing equal access for students with disabilities. Any student with a disability needing academic adjustments or accommodations should speak with the instructor or the Disability Resource Center (784-6000 or http://www.unr.edu/drc) as soon as possible to arrange for appropriate accommodations.

Statement on Academic Success Services:

Your student fees cover usage of the Math Center (784-4433 or http://www.unr.edu/mathcenter/), Tutoring Center (784-6801 or http://www.unr.edu/tutoring-center/), and University Writing Center (784-6030 or http://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:

The University of Nevada, Reno describes academic dishonesty as, "cheating, plagiarism, or otherwise obtaining grades under false pretenses." 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 assignment. For more details, see http://www.unr.edu/administrative-manual/6000-6999-curricula-teaching-research/instruction-research-procedures/6502-academic-standards.

Statement on Discrimination and Harassment:

The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University’s Equal Opportunity & Title IX Office at 775-784-1547. Resources and interim measures are available to assist you. For more information, please visit: http://www.unr.edu/equal-opportunity-title-ix.

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. https://www.unr.edu/administrative-manual/6000-6999-curricula-teaching-research/instruction-research-procedures/6507-intellectual-property-policy

5. TA Mailbox

Rules:

To turn in a make-up lab report, you must first have it date-stamped by the date-stamping machine in the Department of Physics office (Leifson Physics, Room 225; usually open 8-5 M-F, closed weekends), then place it in the correct TA mailbox. Do not try to leave your report with the office or in any other location, as it will get lost and you will not receive credit for your work.

Location:

TA mailboxes are in the Leifson Physics building, 2nd floor west hallway, located behind a glass door across the hall from Room 205. Leifson Physics is next to the Schulich lecture hall (see image below).