PHYS 180L

Engineering Physics I Lab

Spring 2015

Instructor: Dr. Thomas Herring  Phone: 445-4277
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Office Hours:
M 10:00 am – 11:00 am
T 12:00 pm – 2:00 pm
W 5:30 pm - 6:45 pm
Th 12:00 pm – 2:00 pm
F By Appointment

Text: No required text. Laboratory materials will be provided during each lab session.

Prerequisites: MATH 181  Co-requisite: PHYS 180

Meeting Times: W 7:00 pm – 9:45 pm

Grading:
Lab Summaries – Drafts 15%
Lab Summaries – Final 45%
Lab Notebook 10%
Formal Lab Report – Draft 10%
Formal Lab Report – Final 20%

95% – 100% A 73% - 75% C
90% - 94% A- 70% - 72% C-
86% - 89% B+ 66% - 69% D+
83% - 85% B 63% - 65% D
80% - 82% B- 60% - 62% D-
76% - 79% C+ Below 60% F

Group Work: Nearly all of the work in the laboratory will be done in groups. Groups will consist of no more than 3 students (pairs are recommended). The instructor may change the composition of groups at any time. Discussion among groups is expected and encouraged but each group must perform their own measurements. Only in the case of limited equipment and with the instructor’s consent will groups of more than 3 be allowed to perform experiments as a single unit.
**Lab Summaries:** Each lab summary will consist of a brief written report that at a minimum addresses each of the following questions regarding the experiment(s) from that session, in a narrative format (don’t just give me one line or a bullet point list for each of these items). These lab summaries will be scored on a scale of 1-10.

- What principle(s) of physics are you investigating?
- What hypothesis/hypotheses have you proposed to test during this session?
- What data will you gather to perform the experiment? (Note, you do not need to include the actual data gathered, just a list of measured physical properties which were measured during the experiment).
- What quantities did you calculate and what formulas were used? (Note, you do not need to show actual calculations, just formulas for quantities which define how those calculated quantities relate to measured physical properties of the system).
- What conclusion(s) can be drawn from your experiment(s), particularly but not limited to the validity of your hypothesis/hypotheses? Back this up by interpreting your data.
- In what ways could your experiment be improved and/or changed to improve the accuracy and/or precision of your results?

For each lab exercise the group should elect a member to author a lab summary. Before each due date this responsibility should have been assigned to every member of the group at least once.

**Lab Summary - Draft:** For each lab summary a draft version will be handed in electronically through Canvas. Each draft handed in will have two peer reviewers from the class assigned to it. These peer reviewers will provide editorial comments and feedback on how to improve the summary. Only upon completing your assigned peer reviews will your draft summary have a score recorded. If you do not complete peer reviews as assigned you will receive a score of zero for that summary draft. The top three of four lab summary – draft scores will count for 15% of the final grade in the lab course.

**Lab Summary - Final:** One week after the summary drafts are due a final version will be due and should be handed in electronically through Canvas. The final version should be improved from the draft based on the feedback from peer reviews. If a student submits an unaltered copy of the draft that student will receive a zero score for that final summary. The top three of four lab summary – final scores will count for 45% of the final grade in the lab course.

**Lab Notebooks:** Each student should independently keep a lab notebook to record the details concerning, experimental data, and their observations about the experiment(s) carried out during each lab session. This also ensures that every student has their own record of the experiments in which they have participated during the course. Lab notebooks will be reviewed at random by the instructor and a grade will be recorded for each student individually. There will be at least 4 reviews of each student’s lab notebook. The score from each review will carry equal weight towards the determination of the grade. Also, a measure of participation as a part of your group, as determined by the instructor’s observations during the lab sessions, will carry the weight of one review of the lab notebook in the lab notebook portion of the grade.

The detailed contents of the lab notebook will not be the basis for the grade. Rather, the grade will be based upon the completeness of the record and the ease with which the student can retrieve details from the notebook when asked to do so. For example, the instructor might ask a student to show their uncertainty in a calculated quantity from the 2nd lab session during a review which is taking place during the 10th lab session. The student’s lab notebook should be organized in such a fashion that
the retrieval of such details is a trivial task for the author of the notebook (not necessarily the instructor or some other student). The completeness of the lab notebook is also an indication of participation by the student and will be reflected in the aforementioned participation score which factors into the lab notebook portion of the grade. Reviews of lab notebooks will be scored from 0 – 5 where zero is a completely missing record and 5 is a complete, coherent, and easily retrieved record.

**Formal Lab Report**: Details on how to write a formal lab report will be covered in class. An example lab report will also be provided. The information recorded in the lab notebook, including not only data but also experimenter observations, will be invaluable in the construction of the formal lab reports. The structure of these reports is more formal than the summaries and will be discussed at length in class. Each student should submit one formal lab report. Members of a lab group must choose different experiments for the topics of their formal lab reports.

**Formal Lab Report - Draft**: A draft of the formal lab report is due as scheduled in Canvas (approximately the 14th week of the semester). This draft should be handed in electronically through Canvas. Each draft handed in will have two peer reviewers from the class assigned to it. These peer reviewers will provide editorial comments and feedback on how to improve the report. Only upon completing your assigned peer reviews will your draft report have a score recorded. If you do not complete peer reviews as assigned you will receive a score of zero for the report draft. The formal lab report – draft scores will count for 10% of the final grade in the lab course.

**Formal Lab Report - Final**: Two weeks after the report drafts are due a final version will be due and should be handed in electronically through Canvas. The final version should be improved from the draft based on the feedback from peer reviews. If a student submits an unaltered copy of the draft that student will receive a zero score for the final formal lab report. The Formal Lab Report – Final will count for 20% of the final grade in the lab course.

**Makeup Policy**: Makeup of missed lab sessions can be arranged with the instructor and lab assistant. This should be arranged well in advance of pending due dates for lab summary drafts. **Only if you have notified the lab assistant or instructor in advance that you will miss a lab session you will be allowed to make up the lab you missed.** No work will be accepted after the due date.

**Extra Credit**: There is no extra credit available.

**Dishonesty in Class**: I don’t anticipate any problems but here’s the policy anyway. Any dishonesty/cheating will result in an F in the course.

**Class Conduct**: Please be respectful of the learning environment, your fellow students, the instructor, and any visitors. This includes entering and leaving the room quietly (especially if arriving late or leaving early), silencing cell phones during class (just leave the room if you need to take the call), and engaging in side conversations not relevant to the course material.

**Lab Safety**: The safety of everyone in the lab is the collective responsibility of all participants. Students are required to observe all posted signs and follow any directions given by the instructor or lab assistant. Any behavior deemed dangerous or inappropriate by the instructor or lab assistant will be immediately halted. If you observe unsafe behavior taking place you must inform the instructor or lab assistant as soon as possible. Failure to comply with matters of safety will result in the expulsion of the violator from the lab for the remainder of that lab session. Students must read and sign the lab safety handout before participating in any lab exercises.
Disability Statement: WNC supports providing equal access for students with disabilities. Susan Trist (DSS Coordinator) is available to discuss appropriate academic accommodations that students may require. Please meet with me and contact Susan (445-3278) if you might require any accommodation.

I: Catalog Course Description
Explores vectors, rectilinear motion, particle dynamics, work and energy, momentum, rotational mechanics, oscillations, gravitation, fluids, wave properties and sound. Students must co-enroll in both lecture and lab to receive credit.

II: Course Objectives
Upon successful completion of PHYS 180L, the student will perform with a minimum accuracy of 80 percent, the following objective:

- Apply the scientific method to experiments in the laboratory.
- Develop procedures and observational skills as data is taken and gain a fundamental understanding of simple and complex apparatus used in the experiment.
- Apply analytical techniques, statistical analysis, graphical analysis, spread sheet data/recording to the experiments.
- Verify the theoretical ideas and concepts covered in lecture by completing a host of experiments.
- Take the time to discuss the procedure, the data, and the results of the experiment with the lab partner.

III: Course Linkage
Linkage of course to educational program mission and at least one educational program outcome.

General Education Mission:
PHYS 180L is a general education class that promotes the development of knowledge, skills, and attitudes that will benefit students in their personal and professional endeavors.

General Education Student Learning Outcome:
Students who successfully complete PHYS 180L satisfy the General Education Student Learning Objectives of ensuring that students:

- Possess adequate problem solving, creative reasoning, and critical thinking skills.
- Understand the methods of science and the roles that science and technology have in the modern world.

Program Mission for AA/AS degree:
PHYS 180L satisfies the A.A. /A.S. degree mission by providing academic knowledge and skills for students to successfully transfer to four year institutions in order for them to meet their higher educational goals.

Program Student Learning Outcomes for AA/AS degree:
Students who successfully complete PHYS 180L will know the subject matter to a level that is appropriate for the emphasis of their degree.