Physics 251L
Instructor: Kyle T. Strand
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Office Location: South Engineering, Rm 201
Office Hours: T: 9:00AM - Noon, or by appointment. Office hours will be in South Engineering, Rm 322.
Course Website: [http://www.ndsu.edu/physics/lon_capa](http://www.ndsu.edu/physics/lon_capa)

Course Description: This course is to supplement theory you learn in Physics 251 with hands-on experimentation, and to develop technical communication skills and laboratory techniques.

Prerequisite(s): Enrollment or a passing grade in Physics 251 University Physics I is a requirement for this course.

Text: [Tipler & Mosca, Physics for Scientists and Engineers, 6th Edition](http://www.ndsu.edu/physics/lon_capa)

Additional Materials: Pen, paper, access to a personal computer with word and data processing software.

Pre-Class Preparations: Please print and read the section on the LON-CAPA web service as well as the relevant material in the book before class begins. This will enable you to understand the experiments a lot better.

Class Procedure: Each lab session will begin with a short review of the relevant theory, and a discussion of procedures and precautions. After lab starts I will typically check each group to make sure the experiment is going as planned. If you have any questions during lab that are not made clear in the instructions, please come and find me, as I may not get to your lab group in a timely fashion. Assignments and laboratory reports are due by the beginning of the next lab period after they are assigned. Graded assignments and lab reports will usually be returned at the beginning of the next lab period after they are due.

Lab Reports: You are expected to turn in a lab report for each lab activity. Only one lab report from each lab group is required. The fundamentals of scientific writing will be discussed and practiced throughout the semester. Lab reports are to be typed in full, complete sentences. The following format is strongly suggested:

Title: Cover page or headline including the lab title, your name, your lab partners names, institution, the date of the experiment, and your assigned section number.

Introduction: The Introduction should include two main ideas: the purpose and the importance. The purpose is fairly straight forward, it should be the reason you are doing the lab. Why are you doing the lab? The answer to that question is the purpose. The next question you should be able to answer is: Why should we care? The answer to that is the importance of the lab. As a final note any formula that you used should be explained in the introduction.

Procedure: In this section there should be two sub-sections. The first should be the Materials. This is just going to be a bulleted list of any equipment that is unique. A good rule of thumb for listing material is list any material that not all labs would normally have. The next section should be you Experimental section. This is just a section that recalls the steps you took in the lab. Usually this is in paragraph form.

Results: Data/Error Analysis: This is where your manipulated data will go. This is perhaps the most important section of your lab report. In this section you will need to explain what your data means. What is it saying? Along with that this section is also where you should discuss possible errors in the experiment.

Conclusion: This should be short and should address your purpose.

Data: This is where your raw data will go. Full-page graphs (including copies of any graphs embedded in previous sections), and all data taken during lab.
I urge students to choose lab partners with whom you'll have the easiest time coordinating out-of-class work.

**Attendance:** I will be taking attendance lists. A missed lab is worth 0 points. I must be informed at least 24 hours in advance of any non-emergency absences before I consider allowing a make-up lab. No student will be allowed more than one make-up lab for any reason. If you cannot make it to lab for your scheduled section, but can attend another section, you must discuss your intentions with me no later than one hour before the section you wish to attend. Attending an alternate section does not count against you.

**Grading:** I will grade your reports based on the demonstration of your knowledge of physics, and your ability to communicate your objectives and findings, not on the error of your results. It is acceptable to have results which are not what was expected, as long as you have a reasonable explanation as to why (detailed error analysis). Your grade will not depend directly on your results, as long as you work to get the best results you can, and understand the relevant physics. If, during the course of your experiment, you suspect your results are not correct, please inform me—often times the problem can be corrected in class. Each lab report is worth 10 points. The Lab report with the lowest score from the lowest lab attended will be ignored. Your final letter grade is based on the following scale: 90% and above is an A, 80% to 89% is a B, 70% to 79% is a C, 60% to 69% is a D, and less than 60% is an F. Lab reports that are late by less than a week are worth half credit. Lab reports more than a week late are worth zero points. Failure to hand in a lab report will drop your final grade by one letter. Failure to hand in two or more lab reports will result in automatic failure of the course.

**Coursepack:**

The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

All access to NDSU computers must respect NDSU Senate Policy, section 158: Acceptable use of Electronic Communication Devices,

www.ndsu.nodak.edu/policy/158.htm.

Any students with disabilities or other special needs, who need special accommodations in this course are invited to share concerns or requests with the instructor and to contact the Disability Services Office as soon as possible.