

Physics 121 Lab

Spring 2020

Section 02/CRN 40044

Class Time:	Thursdays, 4:30-6:50 PM
Class Location:	Workman 115
Instructor:	Megan Y. Hein
Contact Email:	megan.hein@student.nmt.edu
Office:	Workman 315
Office Hours:	By appointment - You may drop in any time I am in the office, but please email me beforehand to make sure I am available. I am also available at the Office of Student Learning in the Skeen Library on Mondays from 5-7 PM.

Course Goals

Labs are an important part of your general physics courses. Interacting with physics in the world around you helps solidify concepts learned in the lecture. After completing this course, students should gain a deeper understanding of the physical relationships described in lecture; understand the experimentation process, including writing down a theory, making observations, and analyzing data; develop the skills needed to write technical reports; and learn to successfully collaborate and document shared work. Proficiency in algebra, geometry, and trigonometry will be assumed.

Course Materials

Physics 121 Lab manual (provided by TA), calculator, and a notebook. The lab manual is yours to keep, but you only get one. I suggest writing your name in the front in case it gets lost.

Policies

1. Please be ON TIME. I will give a short introduction to each lab at the beginning of class. If you are not there for this lecture, I will not repeat it for you.
2. Please set cell phones to vibrate mode during class.
3. Read the labs before coming to class. I reserve the right to give a pop quiz about the lab for that day!
4. A lab report that is turned in more than one week past the deadline, unless you have obtained my permission, is an automatic zero and cannot be dropped.
5. As a general rule, no make-up labs are allowed. You need to bring any issue with missing classes and deadlines to my attention well ahead of time for any consideration. There may be exceptions for emergencies on a case by case basis. I will require proof (such as a doctor's note) before accommodations can be made. (see Attendance section.)
6. Questions in class are encouraged, and questions out of class are always welcome! You can email me, stop by my office, or come to my OSL help session. When emailing me, please include your name, class, and section (or day/time).
7. Additionally, this syllabus is subject to change at any time, at the instructor's discretion.

Attendance

Attendance is **mandatory** as well as a significant portion of your grade! I expect you to attend every lab session. If you want to use an absence as your dropped grade (see Grading section below), you need to inform me of your absence **well in advance**. If your absence is due to an emergency, I will require proof (such as a doctor's note), and you may make up the lab by attending another section that **same week**, as long as I can get permission from another TA.

Grading

There will be a total of 12 labs. Each assignment is worth 100 points, and they are all scaled equally. Most will be lab reports, but occasionally you will turn in worksheets instead. At the end of the semester, the lowest lab grade will be dropped, **EXCEPT** for any automatic zero received. The dropped grade is NOT so you have a free day to skip class; it is simply to allow a cushion in case you have an emergency or pre-arranged absence.

Participation and the signed raw data sheet will count for 30% of your assignment grade, while the report or worksheet will count for 70%. **Assignments are due at the beginning of the following week's lab session, unless stated otherwise!** The grade will be reduced by 10% for each day it is late, up to one week after it was due. Assignments turned in more than one week after the due date will not be graded and are an automatic zero (these CANNOT be used as your drop grade!)

Your reports should be typed to avoid any issues I may have with illegible writing. However, you may leave spaces to handwrite equations and draw sketches if needed - just keep in mind, if I cannot read it, I cannot grade it! Reports should also be written in complete sentences and paragraphs, with NO bullet points or lists.

Each report must contain the following:

1. **Heading:** At the beginning of the report, in the header, include the name of the experiment, your name, the TAs name, the date of the experiment, and the names of all your group members.
2. **Raw Data:** The data recorded during the lab on the Raw Data Sheet needs to be attached/stapled to your write-up. This is NOT considered the report itself. To receive full credit, the raw data has to be checked and signed by the TA before you leave the lab that day!
3. **Introduction:** Write several sentences that describe the purpose of the lab in your own words. What is the lab about and what are you trying to accomplish or learn? **DO NOT COPY STRAIGHT FROM THE LAB MANUAL!!!**
4. **Methods:** A brief paragraph describing the lab setup and procedures taken, including a labeled sketch or photo of the instrument setup. Do not use bullet points!
5. **Analysis:** Complete all tasks listed in the Analysis portion of the lab manual. If asked for in the lab manual, organize any data or results in clearly labeled tables and/or plots. Include sample calculations for each equation used in the analysis (e.g. if asked to calculate velocity, write down the general form of the equation, then use one data point to carry out the calculation, showing all work and including all units: $v = \frac{x}{t} \rightarrow v = \frac{5 \text{ cm}}{1.0 \text{ s}} = 5.0 \text{ cm/s}$). Also include any error analysis asked for in the lab manual.
6. **Discussion/Conclusion:** Discuss your results and compare them to those predicted by theory, both numerically and in words (using your error analysis here is quite useful!). Discuss possible sources of error and explain how they affect your results. Or, if the error is negligible, explain why in the context of the lab. Conclude with 1-2 sentences explaining if your results reflected the purpose and goals stated in your introduction.
7. **Presentation:** Your report must be written in a consistent tense, in complete sentences, and with proper grammar, punctuation, and spelling. All quantities must include their associated units. Any external help received or source used **MUST** be properly acknowledged.

Letter grades will be based on the following numerical scores (+/- grades given rarely at my discretion):

- A: 90-100
- B: 80-90
- C: 70-80
- D: 60-70

Academic Honesty

Please turn in your own work!!! New Mexico Tech's Academic Honesty Policy can be found in the NMT Undergraduate Catalog accessible on the school's website and is strictly enforced. You are responsible for knowing, understanding, and following this policy.

Labs are a group effort and I encourage you to discuss them with your labmates, but plagiarism will NOT be tolerated. Data obtained during the lab session will be the same within each group, as well as some of the data analysis, but all other sections of the lab report *must be your own work*. Any suspicion of a violation of the letter or intent of the NMT policy will be reported to the Lab Director, who will determine the appropriate charges to bring to the office of the Associate Vice President for Academic Affairs. In general, obtaining answers that in any way bypass the need to think about the assignment is a violation of the academic honesty policy and can have serious consequences. If you are ever in doubt, **ask me!!!** Do not turn in anything that is not from your own mind without giving proper credit. This includes any material from the lab manual!

Disability and Counseling Services

New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. In addition, New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call (575) 835-6619.

Emergencies and Campus Police

In the event of an emergency where we are required to evacuate the building, follow all of your TAs instructions. Our meeting place in an evacuation event is the small koi pond and fountain behind Workman. Please convene there so that I may verify everyone is safe.

In the event of any emergency where campus police must be notified, their emergency number is (575) 835-5555. If you need to contact their non-emergency line, the number is (575) 835-5011. The non-emergency services they provide include jump-starting dead car batteries, extracting keys locked in vehicles, safety escorts to anywhere on campus, assistance with dorm room lockouts, first aid, and more.

Note: A portion of the content of this syllabus was adapted from a document provided by Dr. Tina Güth for the NMT Physics Department.