

## Physics 2250L

Fall, 2023

Workman 322

Section 1 (20446), Mon. 14:00-16:20

Section 2 (20447), Thu. 14:00-16:20

**Disclaimer** Although the Instructor will try to preserve the general intent of the syllabus, the Instructor reserves the right to modify the letter of the syllabus to accommodate emergent situations during the semester.

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**Office Hours:** Mon & Thu, 13:00–13:50; Wed, 14:00–16:50; other times by appointment.

### Grading:

Lab work	Lab Notebook	Lab Reports
20%	20%	60%

A 100-point scale is used to grade lab work, notebooks, and papers. Points are tracked and reported on CANVAS. Mid Term and Final grades are reported to Banweb. Since Banweb uses the NMT letter grading system published in the current catalog, the following table is used to translate points to letter grades. Points are rounded to the nearest integer before using the table.

Letter Grade	F	D	D+	C-	C	C+	B-	B	B+	A-	A
100-point scale	[0,59]	[60,66]	[67,69]	[70,72]	[73,76]	[77,79]	[80,82]	[83,86]	[87,89]	[90,94]	[95,100]

**Pre-requisites/Co-requisites:** NA / PHYS 2251

**Course Description:** Laboratory experiments from the subject matter of Physics 2251. [NMCCNS PHYS 1225: General Education Area III.

This course explores some of the concepts presented in the lecture to introduce techniques for obtaining and analyzing experimental observations.

Students are asked to keep track of their lab activities in a lab notebook. Also, they must report their activities and results clearly and concisely in formal Lab reports. The time spent outside of the Lab on preparation, data analysis, and presentation will vary somewhat, but an average of no more than three hours of outside work per Lab is encouraged.

**Mode of Instruction:** This lab is delivered face-to-face.

**Place in Curriculum:** This course is a general education core course and part of the required Curriculum for physics majors.

**Course Learning Outcomes:** The students will demonstrate good record-keeping skills, the ability to make decisions based on their own data, and the competency to report findings using guidelines from relevant physics journals.

**Course Schedule:** Laboratory exercises are performed weekly; the calendar is on the Lab's CANVAS page. The instructions for each Lab are provided in the CANVAS assignments.

## Course Requirements and Policy

**Safety:** No food is allowed in the Lab; beverages should be carried in spill-proof containers. You are expected to follow the instructions for each Lab carefully. In addition, you are required to abide by any NMT protocols for reducing risks in the Lab;

**Mobil Device** It is required that every student registered for the Lab has access to a portable personal computer (laptop or another device) capable of connecting to the campus wireless internet. Your mobile device is used to record the raw data during the Lab.

**Reference Books:** P.R. Bevington and D.K. Robinson, *Data Reduction and Error Analysis*(McGraw Hill, New York, 2003), 3rd ed.

J.R. Taylor, *An Introduction to Error Analysis*(University Science Books, California, 1997), 2nd Ed.

**Laboratory Work:** During the Lab, you are expected to cooperate and discuss with your team how to collect and analyze the data. Rotation of individual roles in a team is required to ensure everyone's participation in the exercises. You are also expected to work with your team on data analysis and sketching the setup to illustrate what is measured.

Approach all issues with professional courtesy and respect the efforts, opinions, and property of others. Be ready to work with all needed materials (pencils, notebooks, Laboratory Manual, personal computer, etc.). Disruptive behavior, including horseplay and reckless use of equipment, will NOT be tolerated.

To minimize disruptions in the Lab, you are required to abide by the following rules of etiquette. Cell phones should be reserved for emergencies –no text. If you must accept a call, please take it outside the Lab. If you are late to the Lab, please keep the disruption to a minimum. Abusers may be asked to leave the Lab.

**Points for Laboratory Work:** Zero points if not present (lab attendance is mandatory). If present, then pre-lab (25 points), data collection effort (50 points), setup sketch and preliminary analysis (25 points).

**Raw data:** A google spreadsheet is assigned to each team to record their data. To record your data on-site, You must bring a mobile device capable of connecting to NMT's wireless network. Data collected in the Lab must have the Instructor's initials and be locked at the end of the Lab but will remain accessible. You may want to download a copy of the data to do the analysis even without an internet connection. Unless specifically directed by the Instructor, sharing data with other teams is not allowed. Only data you collect with your team can be shared within the team, which must be acknowledged.

**Notebook:** You are required to create and maintain an electronic Notebook to document your Lab work. The electronic Notebook is a single electronic document, which may include pictures of hand written work. You are welcome to use any software to create and maintain your Notebook. Nevertheless, the software should let you generate PDF documents from your Notebook. You may use a paper notebook to do your analysis and sketches of the set up, and then add pictures from it to the electronic document. For grading, the electronic notebook is submitted as a single PDF through CANVAS. The lab notebook must include an index page, and all pages must be numbered. The Notebook's Rubric and a Notebook's sample can be found on the Lab's CANVAS page.

**Homework:** *before the Lab* take a Quiz in CANVAS about the coming lab. *after the Lab*, prepare your Notebook for your Instructor's review. Ensure that it has a sufficiently detailed procedure (including sketches of your setup), tables, figures summarizing your data, finalized data analysis, and a summary of your findings. (*Hint: the pre-lab statement from your notebook could be used in answering the quiz or vice versa.*)

**Reports:** You will be assigned four lab exercises for which you must complete a formal report that must be written following the Physical Review style guide:

<https://cdn.journals.aps.org/files/styleguide-pr.pdf>

The report's Rubric can be found on the Lab's CANVAS page. Reports are due a week after the laboratory work is completed and must be submitted as PDF documents through CANVAS.

**Attendance:** It is mandatory, and punctuality in attendance and completion of all assignments on time is required.

**Late Work:** Lab work submitted for grading that is late no more than a week will be accepted but will earn at most 80% of the grade. No lab work past due more than a week will be generally accepted, but we may accept late submissions under extenuating circumstances. Likewise, there are no makeup labs, but we may grant a request under extenuating circumstances.

**Academic Honesty:** Laboratory exercises are a group effort, and discussing the material with each other is encouraged. Data obtained during the lab session is expected to be the same within each group (tables, graphs, etc.). However, your written assignment must be your own work; any help received must be acknowledged, and proper citations of the utilized sources must be included. Plagiarism is not tolerated. 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 in doubt, please ask your Instructor before submitting any work as your own.

## New Mexico Tech Services and Policy

**NMT Academic Honesty:** New Mexico Tech's Academic Honesty Policy for undergraduate and graduate students is found in the catalog, which can be found at:

<https://www.nmt.edu/registrar/catalogs.php/>.

Further information about academic honesty can be found on the Associate Vice President for Academic Affairs website:

[https://www.nmt.edu/academicaffairs/avppa/academic\\_honesty.php](https://www.nmt.edu/academicaffairs/avppa/academic_honesty.php) .

You are responsible for knowing, understanding, and following this policy.

**Reasonable Accommodations:** New Mexico Tech is committed to protecting the rights of individuals with disabilities and providing access and full participation in the educational experience. Students with disabilities who require reasonable accommodations are invited to make their needs known to the Office for Student Access Services (SAS) as soon as possible. Accommodations are not retroactive and may take some time to implement. The process for requesting accommodations can be found at their website <https://www.nmt.edu/ds/academicaccommodations.php>.

You can contact SAS in person at the Fidel Center Room 245, call 575-835-6209, email [access@nmt.edu](mailto:access@nmt.edu) or book through the link on our website (<https://calendly.com/theresa-kappel-student-access-services/nmt-student-access-services?month=2022-08>).

**Counseling Services:** New Mexico Tech offers individual and couples counseling, safety assessments, crisis intervention, outreach and consultations through the Counseling Center. These confidential services are provided free of charge by licensed professionals. Please note that changes in the delivery of counseling services may still be ongoing. For more information on how to access services, please call 835-6619, email [counseling@nmt.edu](mailto:counseling@nmt.edu) or check out our website at <https://www.nmt.edu/cds/>.

**Respect Statement:** New Mexico Tech supports freedom of expression within the parameters of a respectful learning environment. As stated in the New Mexico Tech Guide to Conduct and Citizenship: "New Mexico Tech's primary purpose is education, which includes teaching, research, discussion, learning, and service. An atmosphere of free and open inquiry is essential to the pursuit of education. Tech seeks to protect academic freedom and build on individual responsibility to create and maintain an academic atmosphere that is a purposeful, just, open, disciplined, and caring community."

**COVID-19 Safety Issues for Face-to-Face Instruction:** COVID-19 and other Health-Related Safety Issues for Face-to-Face Instruction: Please note: provisions on masks, vaccines or other possible COVID-related requirements are subject to change as the situation evolves, based on guidance from the Centers for Disease Control, the State of New Mexico, and university officials (i.e., the President and the Board of Regents). For the most up-to-date guidelines, please consult NMT's COVID-19 information page: <https://www.nmt.edu/covid19/>.

Students should not come to class if they are feeling ill and should follow any quarantine guidelines that they are given in the event of exposure to COVID-19. If you are sick, you should contact your Instructor immediately with a request for making up any missed work and assignments, contact the Student Health Center, and consider getting tested for COVID-19 (as applicable). Please note the Student Health Center does not provide sick notes to students who are not seen by them.

**Title IX Reporting:** Sexual misconduct, sexual violence and other forms of sexual misconduct and gender-based discrimination are contrary to the University's mission and core values, violate university policies, and may also violate state and federal law (Title IX). Faculty members are considered "Responsible Employees" and are required to report incidents of these prohibited behaviors. Any such reports should be directed to Tech's Title IX Coordinator (Dr. Peter Phaiiah, 122 West Hall, 575-835-5953 (O), 575-322-0001 (C), [titleixcoordinator@nmt.edu](mailto:titleixcoordinator@nmt.edu)) or reports can be filed online to Tech's Title IX & Sexual Misconduct Report. Please visit Tech's Title IX Website ([www.nmt.edu/titleix](http://www.nmt.edu/titleix)) for additional information and resources.

**Student Success:** New Mexico Tech offers numerous peer tutoring services for students who are struggling in their courses, or who just wish to receive friendly advice, including the Office of Student Learning (Skeen Library, <https://www.nmt.edu/osl/>), the Writing and Communication Lab (Skeen Library, <https://www.nmt.edu/academics/class/center.php>), and numerous department-run centers. These services are free of charge to students! Students may also consult the Associate Dean of Student Success, Elaine Debrine Howell ([elaine.debrinehowell@nmt.edu](mailto:elaine.debrinehowell@nmt.edu)) or may receive emails from her if they are struggling in class.

To read about the services a student will need to be successful visit MyNMT: <https://www.nmt.edu/mynmt.php>