

## Physics 411

Fall, 2023

Workman 310

Section 1 (CRN:21764), MWF 0900-0950

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

**Instructor:** Carlos Lopez Carrillo.  
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 Office: 111 Workman Bldg.

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

### Grading:

Praxis homework	20%
Review homework	20%
Partial Exam I	20%
Partial Exam II	20%
Partial Exam III	20%

A 100-point scale is used to grade homework, and exams. 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:** *PHYS 1320 or PHYS 2251; PHYS 340*

**Course Description:** A course dealing with the effects of heat and work on gases, liquids, and solids. The equations of state and the first and second laws of thermodynamics are presented with applications to heat engines and chemical processes. An introduction is given to kinetic theory and statistical mechanics.

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

**Mode of Instruction:** This class is delivered **face-to-face**. Nevertheless, we observe all applicable COVID-19 safety protocols –including a backup plan to deliver the lecture online.

**Course Goals:** Our goal is to review the concepts of energy and entropy and present the bridge between the observable macroscopic phenomena and the Microscopic Physical Theories that explain them.

**Course Learning Outcomes:** Students should learn how to solve exercises that involve the first and second laws of Thermodynamics. They should also learn how to apply statistical mechanics tools.

**Course Schedule:** A tentative calendar for the topics to be covered is given below.

## Course Requirements and Policy

**Safety:** You are required to abide by all NMT safety protocols.

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

**Book:** Daniel V. Schroeder, *An Introduction to Thermal Physics*  
Oxford University Press, ISBN:9780192895547.

Also available as eBook (ISBN:9780192648105) and paperback (ISBN: 9780192895554).

**Tests** Tentative dates for the three partial tests are shown in the calendar below. Note that the content of each test and its date may vary as I see fit, but I will let you know at least a week in advance. There are no redo tests, but a test may be taken out of schedule under extenuating circumstances.

**Homework:** There are two types of Homework: Praxis and Review.

Praxis homework is assigned in almost every Class, and it is due on the following day at midnight. This type of homework is delivered using a Quiz format in CANVAS.

Review homework is usually assigned weekly on Mondays. This type of homework is assigned through CANVAS, and it must be submitted as a PDF through CANVAS. Nevertheless, this type of homework does not have to be typed or typeset. You may work by hand on paper and submit a scanned copy or a captured image of it. Your solution to each assigned problem must have three parts: setup, elaboration, and final answer. A good setup describes the plan to solve the problem, including a sketch and relevant equations. During the elaboration, you carry out the plan; you are expected to be explicit, but try not to plug any numbers until you have a final algebraic expression; The final answer must be labeled as such and include appropriate Units; Homework problems non conforming to this template or that are illegible will be returned to you with zero points.

The Review homework is a two-step process consisting of Initial and Revision efforts. The Initial effort is due in writing a week from its assignment. Once I grade your homework, I'll post the solution. You have to the Friday before the next test to correct your homework and submit your revisions.

The Review Homework grade is the total number of points (Initial plus Revision) times 10. Points are assigned as follows:

Points for Initial effort

Status	Setup	Elaboration	Final Answer
Missing	0	0	0
Require Major Revisions	1	1	0
Require Minor Revisions	2	2	0
Accepted as it is	4	4	2

If you get 10 points during the Initial effort, you do not submit a revision.

For the **Revision** effort, the setup, elaboration, and final answer are worth 1 point each, if they are acceptable.

**Grading:** Once a grade has been assigned to your work, you have up to two weeks to dispute the grade; there is no limit to discuss the graded work.

**Late Work:** Work submitted for grading that is late no more than a week will be accepted but will earn at most 80% of the grade. In general, no work past due more than a week will be accepted, but we may accept late submissions under extenuating circumstances.

**Missed Work:** The lowest three grades from the praxis homework will be dismissed (a week's worth); the lowest grade of the review homework will be dismissed (a week worth).

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

Approach all issues with professional courtesy and respect the efforts, opinions, and property of others. Be ready to work with all needed materials (book, pencil, notebooks, personal computer, etc.). Disruptive behavior will not be tolerated.

**Academic Honesty:** Discussing Class' material with each other is encouraged. However, your written assignments must be your own work. Plagiarism is not tolerated.

## New Mexico Tech Services and Policy

### Student Resources

Wondering where to go for help? Please see the offices below or visit the "Where NMT Students Should Go for Help" website.

**NMT Academic Honesty:** New Mexico Tech's Academic Honesty Policy for undergraduate and graduate students is found in the student handbook, which can be found at: <https://www.nmt.edu/studenthandbook/>. You are responsible for knowing, understanding, and following this policy.

**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/>), Math Helproom

(<https://www.nmt.edu/academics/math/ugrad/mathhelproom.php>), 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 Dean for Student Success Initiatives,

Elaine Debrine Howell (Fidel, rm. 237; 575-835-5208; [elaine.debrinehowell@nmt.edu](mailto:elaine.debrinehowell@nmt.edu)) or may receive emails from her if they are struggling in class.

**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://nmt.edu/ds/for\\_students.php](https://nmt.edu/ds/for_students.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.

**Counseling Services:** The Counseling Center is very excited to announce that Tech has partnered up with the Virtual Care Group (VCG), to offer free supplemental healthcare services to our degree-seeking students. This virtual healthcare includes unlimited Tele-medical and unlimited Tele-therapy/counseling sessions available 24/7, as well as life coaching. Both in-person sessions on campus and this virtual healthcare are available for those degree-seeking students currently enrolled for Fall classes. Download The Virtual Care Group app from your app store. For questions about the platform, please email VCG's Care Team at [care@virtualcaregroup.com](mailto:care@virtualcaregroup.com). For more information on services at NMT, 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."

**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, 238 Fidel Student Center, 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.

