PHYS 1710.001

University Physics I: Mechanics

Syllabus

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GAB 525D	PHYS 209	PHYS 209
M F | 1-2	T | 3:30-4:20	M | 3-3:50

Lecture	PHYS 102	09:00-09:50	M W F
Recitation .201	PHYS 112	10:00-10:50	M W
Recitation .202	PHYS 112	2:00-2:50	M W
Recitation .203	PHYS 112	11:00-11:50	M W
Recitation .204	PHYS 112	1:00-1:50	M W
Recitation .211	LANG 302	1:00-1:50	T Th
Recitation .212	PHYS 116	12:00-12:50	M W
Recitation .213	WH 315	3:00-3:50	M W

You are required to be in *one* Recitation session.

This is a *face-to-face* (in person) course. All course materials will be available on Canvas.

Communication

Communication is extremely important. All communication should be conducted through appropriate emails shown above. *Do not message us through Canvas*—it doesn't always come through in a timely manner. In most cases, you can expect a response within 24 hours. I will not expect my TA's to respond over weekends or holidays.

Course Description

PHYS 1710 is the first course in a calculus-based sequence designed for science and engineering majors. This course introduces the fundamental principles of Newtonian mechanics, including motion, forces, energy, momentum, and rotation. However, this is not just a class about solving equations—it is a course in learning *how to think* and *how to problem solve*. Students will engage deeply with the concepts behind the math, using physics as a framework for understanding reality and developing analytical reasoning that will give skills vital to STEM careers. Lectures blend historical context, philosophical insight, and hands-on problem-solving to help students build lasting intuition—not just test-taking skills.

Prerequisites

Student must complete MATH 1710 (Calculus I) with a grade of C or better. This is to include all the prereqs for Cal I as well.

Required Materials

- Textbook and Online Homework
  - *University Physics*, 15^{th} ed. by Young and Freed.
  - You are required to obtain access to the Mastering Physics online homework (the book itself is not mandatory, if it matters anymore).
  - Access Code
    - watson81297
  - Should be at UNT Bookstore, or you can buy direct.
- Scientific calculator (I suggest the TI-36x Pro).

Course Objectives

Successful students of this course will have met the following:

1. Build a (relatively) deep, conceptual understanding of classical mechanics—not as a list of formulas that must be memorized, but as a logical framework for describing, predicting, designing, and building real-world behavior.
2. Connect core physical quantities like force, acceleration, energy, and momentum through cause-and-effect reasoning, rather than rote memorization.
3. Learn to model systems using vectors, diagrams, and calculus, with clear attention to units, structure, and logical consistency
4. Approach unfamiliar problems with confidence by applying *first principles* thinking, estimating outcomes, and breaking complex systems into simpler parts.
5. Begin to develop fluency in applying mathematical tools to analyze motion, forces, energy transfer, and stability in physical systems—laying groundwork for all future engineering, and most sciences', coursework.
6. Be able to communicate, and properly argue, your logic and reasoning vis-à-vis written solutions.
7. Understand a brief historical and philosophical foundations of science to better appreciate how engineering stands on a tradition of inquiry, experimentation, and clarity of thought, and how that tradition continues to constantly evolve.
8. Be well-prepared for future STEM coursework by mastering foundational skills.
9. Learned how to learn.

Course Structure

- **Lectures**

  will include explanations, discussions, and examples. Often, I will explain a theory with an example. I will try to make the examples as similar to the exam as possible, but they will not be 1 : 1. Thus, do not memorize how to solve that specific problem, but the method of approach.

- **Quizzes**

  will be done during lecture time and will usually take $20 - 30$ minutes where anything previously covered can be asked. You must be physically present within the classroom boundaries to gain credit. Taking the quiz while not in the room will result in an automatic 0 and a referral for academic dishonesty.

- **Demonstrations**

  I will dedicate time in each unit to demonstrate my claims. I will ask for volunteers, but might also randomly call on someone to assist.

- **Exams**

  There will be a midterm and a comprehensive final.

  - Exams will be in person during normal lecture times—you will have from 09:00–09:50.
  - Once the first exam is turned in, no one will be allowed to start afterwards.
  - You will be provided with
    - The exam
    - ScanTron
    - Formula Sheet (will be posted in advance)

      You may not bring an outside formula sheet
    - Extra paper upon request

    You areresponsible for anything else.

- **Assignments**

  Available every Monday at 08:00 am and due every Sunday at 11:59 pm CST.

Grading

Item	Weight	Final Grading
Final	40 %	A $\geq 90\%$
Midterm	20 %	B $= 80 - 89\%$
Quizzes	15 %	C $= 70 - 79\%$
Assignments	15 %	D $= 60 - 69\%$
Recitation	10 %	F $< 60\%$
Tot Possible	100 %	

How to determine your grade:

$$\underbrace{G}_{\text{Final Grade}} = \underbrace{0.40\,F}_{\text{Final}} + \underbrace{0.20\,M}_{\text{Midterm}} + \underbrace{0.15\,\bar{Q}}_{\text{Quiz avg}} + \underbrace{0.15\,\bar{A}}_{\text{Assignment avg}} + \underbrace{0.10\,\bar{R}}_{\text{Recitation avg}}$$

$$\text{Final Grade, } G = \begin{cases} \text{A}, & G \geq 90 \\ \text{B}, & 80 \leq G < 90 \\ \text{C}, & 70 \leq G < 80 \\ \text{D}, & 60 \leq G < 70 \\ \text{F}, & G < 60 \end{cases}$$

where any rounding will be based on a statistical analysis. No curves.

- **Homework will be due every Sunday** at 11:59 pm CST. Assignments will receive a 10% penalty for everyday late. For example, turning in your assignment on a Monday afternoon will result in an automatic 10% reduction in grade.
- **Recitation attendance is required**. The purpose of recitation is time to practice problems with your classmates and your TA and to ask your TA questions. Your grade here is up to your TA
- **Extra credit.** These will be assignments posted throughout the semester, but are not required. Some opportunities will add points (up to a letter grade) to your quizzes. Others will be applied to either your Midterm or Final, up to a letter grade.

Tentative Schedule

Week	M	W	F	Date
1	Introduction	Math Review	What is physics?	1/12–1/16
2	**MLK**	Kinematics	Free Fall	1/19–1/23
3	Projectile Motion I	Projectile Motion II	**Quiz 1**	1/26–1/30
4	Newton I	Newton II	Newtons III	2/2–2/6
5	Newtons IV	Newtons V	**Quiz 2**	2/9–2/13
6	Work/KE	KE/PE	PE/Conservation	2/16–2/20
7	Impulse/Collisions	Collisions	**Quiz 3**	2/23–2/27
8	Catch/Review	Catch/Review	**Midterm**	3/2–3/6
9		**SPRING BREAK**		3/9–3/13
10	Rotation I	Rotation II	Rotation III	3/16–3/20
11	Rotation IV	Rotation V	**Quiz 4**	3/23–3/27
12	Waves I	Waves II	Waves III	3/30–4/3
13	Waves IV	Waves V	**Quiz 5**	4/6–4/10
14	Fluids I	Fluids II	Thermo I	4/13–4/17
15	Thermo II	Thermo III	Open Discussion	4/20–4/24
16	Presentations/Review	Review	Review	4/27–5/1
17		**FINAL 5/6 @ 07:30–09:30**		5/4–5/8

Assignments are due every Sunday by 11:59 pm, CST, starting 1/18. That will open every Monday by 08:00 am.

> " You must note that students will be notified by Eagle Alert if there is a campus closing that will impact a class and describe that the calendar is subject to change, citing the Campus Closures Policy (https://policy.unt.edu/policy/15-006). "

Course Policies

During Class

Don't do *anything* that will distract from me or others. Live by that axiom. Discussions are more than welcome, distractions are not.

In this course, we will try to elevate the conversation. We won't waste time tearing *people* down—we challenge *ideas*, test assumptions, and pursue understanding. Engage with each other's *ideas* based solely on their logical coherence, not on personal or moral judgments. This expectation applies both during and after class. Any form of harassment or targeting of another student for comments made in class will not be tolerated. Said students will be referred.

Part of becoming a Scientist,Technologist, Engineer, or Mathematician is learning how to conduct yourself in a professional, respectful, and focused environment. That starts now, in this room. Etiquette isn't about rules for the sake of rules, it creates a space where intellectual effort is actually possible. This is why most online discourse is impossible.

Attendance Policy

You are required to be present inside the lecture hall for any quizzes or exams. If you have a grade for either, but you were not personally and physically present, you will receive a 0 and a referral.

Policies on Incomplete Grades and Late Assignments

Many extensions have I given, just ask. If permission not given to you, and late it is, 10% off the grade for each day late. Last day to turn any work in will be 5/1.

Academic Integrity and Honesty

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct. This mostly applies to exams. Cheating on an exam will result in an automatic zero and a referral.

Accommodations for Disabilities

The University of North Texas makes reasonable accommodations for students with disabilities. To request accommodations, you must first register with the Office of Disability Access (ODA) by completing an application for services and providing documentation to verify your eligibility each semester. Once your eligibility is confirmed, you may request your letter of accommodation. ODA will then email your faculty a letter of reasonable accommodation, initiating a private discussion about your specific needs in the course.

You can request accommodations at any time, but it's important to provide ODA notice to your faculty as early as possible in the semester to avoid delays in implementation. Keep in mind that you must obtain a new letter of accommodation for each semester and meet with each faculty member before accommodations can be implemented in each class. You are strongly encouraged to meet with faculty regarding your accommodations during office hours or by appointment. Faculty have the authority to ask you to discuss your letter during their designated office hours to protect your privacy. For more information and to access resources that can support your needs, refer to the Office of Disability Access website (https://studentaffairs.unt.edu/office-disability-access).

Etiquette

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and lectronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at (deanofstudents.unt.edu/conduct.)

Survivor Advocacy

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565-2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.

AI

In this course, you are encouraged to use Generative AI (GenAI) tools (e.g., Claude, ChatGPT, Grok, etc) to support your learning and develop skills for a GenAI-oriented workforce. However, GenAI should complement, not replace, our course materials. See the AI rubric. If something seems unclear, feel free to ask.