

General Physics II

Physics 1420

Fall 2023

Lecture Section 001, TuTh 12:30–1:50 p.m. in PHYS 102
Recitation, Fridays 12:00-12:50 , 1:00-1:50, or 2:00-2:50 p.m. in SAGE 230

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Help Hours: M 1:00–3:00pm, Th 10-11am, by appointment, and any time my office door is open

Welcome! As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. Everyone should feel comfortable being their authentic selves in our class. If you have any questions or concerns, do not hesitate to contact me.

Communication: This is a face-to-face class with no Zoom component. All course materials (handouts, lecture slides, etc.) and announcements will be posted in Canvas. You can contact me via email at alexander.barr@unt.edu or by sending a message in Canvas. In most cases, you can expect to receive a response within 24 hours. You are also always welcome to come by my office during office hours or at other times. You are expected to check your UNT email and Canvas messages at least once a day.

Course Objectives: This is a non-calculus based physics course suitable for life science majors and pre-professional students. This course will introduce students to the basic principles of electricity, magnetism, light, and atomic physics. Successful students will be able to solve numerical problems and explain the underlying physics concepts used in applications to many medical instruments as well as everyday life.

Course Pre-requisites: PHYS-1410 (General Physics I) or consent from the Physics Department

Textbook and Online Homework System: The recommended textbook is *Physics*, 12th Edition, by Cutnell and Johnson. Other algebra-based introductory physics textbooks are acceptable including the free [OpenStax College Physics](#) online textbook. **You are required to obtain access to the WileyPlus online homework system.**

Available through the UNT bookstore:

- Physics 12th ed. with WileyPlus ~ \$80 digital rental
 - This provides access to the digital textbook as well as the homework service. If you took PHYS-1410 at UNT and purchased the multi-semester option, then your WileyPlus login should still be valid and you should not need to purchase anything for 1420.

Attendance and Participation: You are expected to attend and participate in all lectures and recitations for the section in which you are enrolled as long as you are healthy. **Lectures will usually involve iClicker questions and Recitations will involve quizzes or group activities for which there is no make-up if you are absent.** If you know that you will miss an upcoming class, let the instructor know as soon as possible to see if any arrangements can be made.

Exams: There will be **four unit exams** given during class in the lecture classroom at the dates indicated on the schedule at the end of the syllabus. A **comprehensive final exam** will be given during finals week according to the UNT final exam schedule. Exam questions will involve both mathematical calculations and conceptual explanations and will be based on material from lecture, recitation, and homework assignments. Exams will involve both multiple-choice and free response questions.

- **There are no make-up exams. Your final exam score can replace your lowest exam score whether that is a missed exam or simply an exam on which you scored lower than the final exam.**
- Questions pertaining to the grading of exams must be directed to the instructor in writing within one week of receiving your graded exam.
- If you have a pre-scheduled commitment that conflicts with one of the exams, contact the instructor as soon as possible.

Homework: All homework will be posted and submitted online using WileyPlus. WileyPlus allows 6 submission attempts for each problem. Homework is intended to be practice so there is no penalty for an incorrect answer as long as you arrive at the correct answer in 6 attempts or less.

Late Homework: There is a 5% deduction per day that a homework is late up to a maximum deduction of 30%.

WileyPlus Instructions: Go to our Canvas page and click Wiley Course Resources in the menu on the left.

The first time you do this you will be asked to create a WileyPlus account or to log into your existing account. If you need to enter a new access code, you will be prompted to do so. This is how you access the digital textbook and other resources. You can access the homework through this portal or by clicking Assignments in Canvas.

Free Physics Help: A Help Room on the second floor of **Hickory Hall 266** is staffed weekdays by tutors to assist you with questions regarding class, homework, or lab. This is a free service and does not require any reservations or prior planning - just drop in. There is plenty of seating and computers so you can go there to work on your homework and have tutors available nearby if you get stuck.

Learning From Mistakes: Learning necessarily involves making mistakes. If you never make mistakes then you are not being sufficiently challenged. The goal is to make most of your mistakes on the homework and during in-class practice so that you can ask questions and review your notes/textbook to learn from those mistakes before you get to the exam. When you make a mistake on an exam, your goal is still to understand what you did wrong and to learn from that mistake.

Opportunities to practice and demonstrate your skills:

- In-class iClicker practice
- Recitation problems
- Homework
- Unit Exam
 - Your unit exam score can replace one recitation score from that unit.
- Final Exam
 - If your final exam score is higher than one or more of your unit exam scores, your unit exam score(s) will be replaced with a weighted average: $0.4 * (\text{original score}) + 0.6 * (\text{final exam score})$
 - If your final exam score is lower than the average of your unit exam scores, your final exam score will be replaced with a weight average: $0.4 * (\text{final exam score}) + 0.6 * (\text{average unit exam score})$

Course Grades: Course grades will be calculated as follows

iClicker	3%
Pre-Lectures	5%
Homework	12%
Recitation	12%
Exam 1	12%
Exam 2	12%
Exam 3	12%
Exam 4	12%
Final Exam	20%

Exams scores will not be curved.

Everyone's semester grade will be computed twice: once with the percentages shown above and again with homework omitted and each unit exam increased to 15%. You will receive whichever grade is higher.

Lab Credit: You must enroll separately in Physics 1440 for laboratory science credit.

PHYS-1420 Goals and Learning Strategies: The goals of instruction in Physics-1420 are to guide you to understand and be able to apply the basic principles of electricity and magnetism, optics, and atomic physics, and to develop your skills and confidence using the diagrams and algebraic calculations. To help in achieving these goals you are encouraged to pursue the following strategies:

Being Successful in PHYS-1420

Actively Participate in Class: Class is more than just taking notes. It is an opportunity to practice solving problems, ask questions, and discuss concepts with your neighbors. If all you do is listen to the instructor, you will get a false sense of understanding. You need to attempt problems on your own or with your neighbor so that when the instructor shows the solution you recognize the subtle or confusing parts that you need to study.

Ask questions: It is OK to ask a question that has already been answered. Any time you ask a question, it shows that you are thinking and trying to learn. Asking questions is part of how you translate ideas from the instructor or the textbook into a form that makes sense to you.

Utilize Help Hours and the Physics Resource Center: Any time my door is open, you are welcome to stop in and ask a question. Do not wait until you feel lost, it's good to stop by with small questions. Also take advantage of the free drop-in tutors in Hickory Hall 266. Visiting a tutor doesn't mean you aren't successful, it means you are taking advantage of the resources available to learn as effectively as possible.

Course Evaluation: The Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available to you on-line at the end of the semester and will provide you with an opportunity to provide feedback to your course instructor. SPOT is considered to be an important part of your participation in this class. You will receive an email from "UNT SPOT Course Evaluations" from no-reply@iasystem.org with the survey link. You will have separate SPOT evaluations for lecture, recitation, and lab. During fall and spring semesters SPOT surveys are open to students to complete two weeks prior to final exams.

Use of AI and Other Technologies: The use of computing tools like [Desmos](#) and calculators to help you calculate and solve equations is perfectly acceptable. Use of ChatGPT or other generative AI tools to solve homework problems is strongly discouraged (this will not prepare you to solve problems yourself on exams). Some students do find it useful to use generative AI to create additional practice problems when studying for exams or to summarize and example from class or a section of the textbook that was unclear.

UNT Policies

Academic Integrity Standards and Consequences: According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

ADA Accommodation Statement: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

Emergency Notification & Procedures: UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Sexual Assault Prevention: 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.

Tentative Lecture Schedule

#	Day	Topic	What's Due
1	Tu 8/19	Ch 25: Welcome, Reflection and Refraction	
2	Th 8/21	Ch 26: Lenses	PL 1
	Friday	<i>Rec: Lenses calculations & diagrams</i>	
3	Tu 8/26	Ch 26: Optical Instruments	PL 2, HW 1
4	Th 8/28	Ch 24&26: Vision, Intensity	
	Friday	<i>Rec: Correcting nearsighted vision</i>	
5	Tu 9/2	Ch 24: Polarization	PL 3, HW 2
6	Th 9/4	Ch 27: Interference	
	Friday	<i>Rec: Polarizers</i>	
7	Tu 9/9	Ch 27: Diffraction	HW 3
8	Th 9/11	Exam 1 - Optics	
	Friday	Exam 1b (optional)	
9	Tu 9/16	Ch 18: Charging & Coulomb's law	
10	Th 9/18	Ch 18: Electric field	
	Friday	<i>Rec: Forces - Coulomb and E field</i>	
11	Tu 9/23	Ch 19: Potential energy and Work	PL 4, HW 4
12	Th 9/25	Ch 19: Electric potential and voltage	
	Friday	<i>Rec: Potential Energy and Work</i>	
13	Tu 9/30	Ch 21: Magnetic force and torque	PL 5, HW 5
14	Th 10/2	Ch 21: Applications	
	Friday	<i>Rec: Mass Spectrometer</i>	
15	Tu 10/7	TBD	HW 6
16	Th 10/9	Exam 2 - Electric & Magnetic Fields	
	Friday	Exam 2b (optional)	
17	Tu 10/14	Ch 20: Adding resistors	PL 6
18	Th 10/16	Ch 20: Ohm's law & Power	
	Friday	<i>Rec: Circuit theater</i>	
19	Tu 10/21	Ch 20: RC Circuits	PL 7, HW 7
20	Th 10/23	Ch 22: Faraday & Lenz	
	Friday	<i>Rec: Defibrillator</i>	
21	Tu 10/28	Ch 23: AC Basics	PL 8, HW 8
22	Th 10/30	Ch 23: Resonance	
	Friday	<i>Rec: LRC circuits - or radio design...</i>	
23	Tu 11/4	Ch 29: Photons & de Broglie wavelength	HW 9
24	Th 11/6	Exam 3 - Circuits	
	Friday	Exam 3b (optional)	

25	Tu 11/11	Ch 30: Bohr model of the atom	PL 9
26	Th 11/13	Ch 31: Nuclear structure & Radioactivity	
	<i>Friday</i>	<i>Rec: Radioactive dating</i>	
27	Tu 11/18	Ch 32: Ionizing radiation	PL 10, HW 10
28	Th 11/20	TBD	HW 11
	<i>Friday</i>	<i>Exam 4 - Modern (required)</i>	
29	Tu 12/2	Review	
30	Th 12/4	Review	

Cumulative Final Exam - Thursday Dec 11, 10:30 - 12:30 PM