General Physics II

Tentative Syllabus

Physics 1420

Fall 2026

Lecture Section 003, MW 3:55–5:15 p.m. in PHYS 104
Recitation 206, Wednesday 5:40-6:30 in SAGE 230

Professor: Dr. Reiko L Zrnic
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Help Hours: M W 1:00–2:00pm, by appointment, and any time my office door is open

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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. All course materials (handouts, lecture slides, etc.) and announcements will be posted in Canvas. You can contact me via email at Reiko.Lukic-Zrnic@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 optics, 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. Lectures will include discussions, demonstrations, interactive conceptual and quantitative questions to understand the fundamental laws of nature and develop problem-solving skills. At the completion of the course, you should be able to apply these concepts in everyday situations and your future career.

PHYS-1420 also contributes to the following core course learning objectives:

- **Critical Thinking:** Creative thinking, analysis, evaluation, and synthesis of information
- **Communication:** Development, interpretation, and expression of ideas through written, oral, and graphical means
- **Quantitative Skills:** Manipulate and analyze data to reach meaningful, informed conclusions
- **Teamwork:** Consider different points of view and work effectively with others to support a shared purpose or goal

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

Textbook and Online Homework System:

Mastering Physics - You are required to obtain access to the Mastering Physics online homework system in order to complete the weekly homework assignments. You can purchase an access code through the UNT bookstore. You have two options available for the access code:

Available through the UNT bookstore:

- 18-week Mastering Physics access including access to the e-textbook ~ $119.69 (net price) Modified Mastering Physics with Pearson eText Access Code for College Physics: A Strategic Approach, 4th edition, Author: Knight ISBN 8220144759431
- Direct purchase through Pearson website
- 18-week Mastering Physics access including access to the e-textbook ~ $95.99 (net price) Modified Mastering Physicswith Pearson eText Access Code for College Physics: A Strategic Approach, 4th edition, Author: Knight ISBN9780136781189

The textbook included with Mastering Physics is College Physics, 4th Edition, by Knight. Other algebra-based introductory physics textbooks are equally useful including the free online textbook OpenStax College Physics 2e.

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 short quizzes 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.

Recitation: The purpose of recitation is to practice problems with your classmates and to ask questions. There will be assignments in recitation each week that you will work as a group and you will need to be present to complete them. There will be a weekly recitation quiz posted on Canvas or in the recitation class. Recitation attendance is required.

Course Structure: This class is classified as "In-Person" which requires in-person participation during the scheduled class periods and recitations. We will use a combination of active group work, lectures, demonstrations, discussions, interactive conceptual and quantitative questions, homework, and more to achieve these goals. At the same time, this course has digital components. To fully participate in this class, students will need internet access to reference on the Canvas Learning Management System.

Exams: There will be **three 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.

Calculator - You will need a calculator for exams that is not also a communication device (i.e. not your phone or your smart watch). The calculator needs to be able to do trigonometric calculations, but graphing is not required

Homework: All homework will be posted and submitted online using Mastering Physics. Mastering Physics 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: If an extension is not requested within 24 hours of the due date, there is a 10% deduction per day. A homework extension can be requested to avoid any late penalty.

Mastering Physics Instructions: Go to our Canvas page and click Access Pearson then Open Pearson then Open MyLab & Mastering. If you have already paid for access to Mastering Physics, use the same username and password to access MyLab and Mastering through Canvas. If you do not have a username and password, you can set that up and enter your access code (from the bookstore) when accessing MyLab and Mastering through 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 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.

Because learning involves making mistakes, you should be able to make mistakes without negatively impacting your grade. Here is how this works in our class.

- In class Quizzes – Use of Learning Catalytics integrated within Pearson's Mastering Physics (starting 3rd week of classes)
- Homework - You have 6 tries on each homework problem (or one fewer try than there are choices on multiple choice questions). You receive full points regardless of whether you get the answer correct on your first try or your 6th try.
- Recitation - In each unit, your exam score can replace your lowest recitation score from that unit. This way if you have an off day or need to be absent from a recitation, you can earn those points back
- Recitation - Quizzes will be given in the recitation as a means of recording attendance and the recitation grade will depend on attendance at the recitation session to which you are assigned according to the following table: Percentage Quizzes Score > 78% = 12% ,65-77% = 9%, < 64% = 6%
- Unit Exams - Your final exam score can replace your lowest exam score, and it can be averaged with any other exams scores that are lower than your final exam score
- **FINAL comprehensive exam will be on Monday, December 7th, 2026, 1:00 pm – 3:00 pm. Final exams CANNOT be made up**

Course Grades: Course grades will be calculated as follows

Class quiz	3%
Dynamic Study	4%
Homework	10%
Recitation	12%
Exam 1	16%
Exam 2	16%
Exam 3	16%
Final Exam	23%

Semester grades will be rounded to the nearest percent:

>= 90% = A

80-89.9% = B

70-79.9% = C

60-69.9% = D.

Throughout the semester, you can monitor your grade in Canvas

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 allowed as long as student understands all the steps how the problems were solved. 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	M 8/17	Ch 17: Wave Optics: Electromagnetic Waves	
2	W 8/19	Ch 17: Wave Optics: Interference and Diffraction	
3 4	M 8/24 W 8/28	Ch 18: Ray Optics: Reflection and Images formed by Mirrors, Refraction and Images formed by Lenses	HW 1
5	M 8/31	Ch 18&19: Thin Lens Equation	
6	W 9/2	Ch 19: Vision, Intensity	HW 2
	M 9/7	LABOR DAY (NO CLASS)	
7	W 9/9	Ch 19: Vision&Ch 20: Charging & Coulomb's law	HW 3
8	M 9/14	Ch 20: Electric field, Conductors	
9	**W 9/16**	**Exam 1 – Ch 17-19**	
10	M 9/21	Ch 21 Potential energy and Work	
11	W 9/23	Ch 21: Electric potential and voltage	HW 4
12	M 9/28	Ch 21: Capacitors	
13	W 9/30	Ch 22: Current Ohm's Law, Resistance, Resistivity	HW 5
14	M 10/5	Ch 22: Simple Circuits, Energy, Power	
15	W 10/7	Ch 23: DC Circuits: Kirkoff's Laws, Series and Parallel Circuits	HW 6
16	M 10/12	Ch 23: RC Circuits and Applications	
17	W 10/14	Ch 24: Introduction to Magnetic Fields	
18	**M 10/19**	**Exam 2 – Ch 20-22**	
19	W 10/21	Ch 24: Magnetic Fields and Torque	HW 7
20	M 10/26	Ch 25: Electromagnetic Induction, Faraday & Lenz Law	
21	W 10/28	Ch 25: EM waves, Polarization, Photon Model	HW 8
22	M 11/2	Ch 26: AC Circuits, LRC, Resonance	
23	W 11/4	Ch 28: Introduction to Quantum Physics	HW 9
24	M 11/9	Ch 28: Particle Duality, Uncertainty Principal	
25	W 11/11	Ch 28: Particle Duality- Experiments	
26	M 11/16	**Exam 3 – CH 23-26**	
27	W 11/18	Ch 29: Atoms Models, Bohr's Model Quantum Numbers and Energy Levels	HW 10
		THANKSGIVING BREAK (NO CLASS)	
28	M 4/27	Ch 30: Medical Applications of Nuclear Physics	
29	W 4/29	Review	

Cumulative Final Exam - Monday December 7th, 1:00 - 3:00 PM