

Electricity and Magnetism

Physics 2220, Spring 2020, Lecture Section 001, Physics Room 102, TuTh 9:30 - 10:50 am

Recitation-201, TuTh 11:00AM - 11:50AM, Phys 112, TA instructor

Recitation-202, Tu 12:30PM - 1:50PM, Phys 112, TA instructor

Recitation-203, Th 12:30PM - 1:50PM, Phys 112, TA instructor

Recitation-204, TuTh 1:00PM - 1:50PM, Phys 115, TA instructor

Recitation-205, TuTh 2:00PM - 2:50PM, Phys 115, TA instructor

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E-mail: yuankun.lin@unt.edu
Office Hours: TuTh 8:30-9:20 am, 10:50 am-11:30 am, and by appointment

Text: Recommended text is *University Physics*, 13th, 14th, or 15th Edition, by Young and Freedman. Other calculus-based introductory physics texts are acceptable; **the successful student will have a text.** Students are required to obtain access to online homework from <https://www.pearson.com/mastering>

Topics: This course will cover electric fields, direct-current and alternating-current circuits, magnetic fields and magnetic induction, electric and magnetic properties of matter, electromagnetic waves, and geometrical and wave optics.

Attendance/Participation/Electronic device policy:

- 1) You are expected to attend all lectures and recitations for the section in which you are enrolled;
- 2) Excuses of non-attendance after lectures without doctor documents are not acceptable.
- 3) The in-class quiz will be counted toward your extra credit and used to check your attendance. You need to hand in your in-class quiz by yourself (i.e. I accept one quiz only from each of you).
- 4) Cell-phone and computers are not permitted to use in the lecture. These electronic devices might be taken away and you can take them back with a fee.
- 5) This is a professional environment. Students are to be respectful of the instructor and other students. No vulgar language or rude behavior will be tolerated.
- 6) Classes will start at the assigned time. Students who arrive late should enter quietly and sit down. Do not walk between the instructor and class across the front of the room as it is disruptive and disrespectful to the instructor and fellow students. Tardy students will not be given any additional time on Exam or Final Exam days.

Specific Expectations: 1. Be able to solve the example questions in slides independently without looking at the class notes. If you cannot solve them, look at the solution in your class notes and try again next day; 2. Be able to finish the home work independently; 3. Be able to finish the recitation questions independently; 4. Read through text-book to understand some key concepts.

Exams:

- 1) There will be **three 90-minute common exams** during the semester, to be given starting at 4:00 pm on Friday afternoons, and a comprehensive final exam. **There will be no makeup exams.**
- 2) Questions pertaining to the grading of exam questions and problems must be directed to the instructor in writing within two weeks after the exams are returned.
- 3) Students are to provide their own pencil, eraser, ink pen and calculator. Phone calculators CANNOT be used.
- 4) Students CANNOT share pencils, erasers, pens or calculators during tests or the final exam.
- 5) **Any student caught cheating will be given a grade of zero for that exam.**

Homework:

- 1) All homework will be posted, collected, and graded via the internet.
- 2) You must access your assignment online through the <https://www.pearson.com/mastering> website, work the problems, and submit your solutions to the server by the due date indicated online.
- 3) Homework grading policy: Your homework grade is determined from your web-based homework score.
- 4) **Details of accessing the homework server are given on the last page of this syllabus.**

Grade: The grading in the course will be based on the total points earned from exams, homework, and lecture and recitation attendance/short quizzes. The point values for each category are given below:

Exams	1 st exam 14% ; 2 nd exam 14% ; 3 rd exam 14% ; 30% for the final; 8% for the best of all exams
Homework	10%
Lecture & Recitation	5% participation/ 5% recitation
Total	100%

Letter grades will be assigned on the basis of the following numerical scores:**90-above 100 =A, 80-89=B, 70-79=C, 60-69=D**

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Lab Credit: You must enroll separately in Physics 2240 for laboratory science credit.

Disability Accommodation: The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must submit a new letter of reasonable accommodation for every semester online and Faculty will also have access to student letters and the students' accommodations when faculty log into the AIM Portal. For additional information see the Office of Disability Accommodation website at <http://www.unt.edu/oda>. You may also contact them by phone at [940.565.4323](tel:940.565.4323).

Drop/withdrawal dates is available at: <https://registrar.unt.edu/registration/spring-registration-guide>. Last day for a student to drop a class with a W: April 17, 2020

UNT's policy on Academic Dishonesty can be found at: <http://www.vpaa.unt.edu/academic-integrity.htm>

Cheating, plagiarism or other forms of academic dishonesty on an exam or final will result in a grade of zero on the exam or final, and possibly an additional reduction in course letter grade.

Canvas will be used to post some useful course materials and your grades. To get to this resource, go to <https://unt.instructure.com/login/canvas> and follow the UNT link to log on. (You will log on using your UNT EUID and password.) Once logged on, select this course. You will find an electronic copy of this syllabus, copies of the PowerPoint presentations from lecture, old exams, and equation sheets.

Tutors are available in Physics Room 209 Monday through Friday to assist you with questions related to solving homework problems.

Tentative Lecture Schedule – *subject to amendment by the instructor*

Session	Date	Day	Chapter: Lecture Topic
1	14 Jan.	Tu	Ch. 21: Electric charges, fields and forces, Coulomb's Law
2	16 Jan.	Th	Ch. 21: Electric field
3	21 Jan.	Tu	Ch. 21: Electric field lines, electric dipole; Ch. 22: Electric flux
4	23 Jan.	Th	Ch. 22: Gauss's law and applications
5	28 Jan.	Tu	Ch. 22: Conductors in electrostatic equilibrium; Ch 23: Electric potential energy
6	30 Jan.	Th	Ch. 23: Electric potential, calculating electric field from potential
7	4 Feb.	Tu	Ch. 23: Applications of electric potential; Ch. 24: Capacitance
8	6 Feb.	Th	Ch. 24: Calculating capacitance, capacitor networks
9	11 Feb.	Tu	Ch. 24: Energy in capacitors, capacitors with dielectrics, dielectric materials
10	13 Feb.	Th	Ch. 25: Current, resistance, Ohm's law
	14 Feb.		Exam 1—Chs. 21-23: Friday, 4:00-5:30 p.m., Physics Building Room 102
11	18 Feb.	Tu	Ch. 25: Electrical power in resistors, emf; Ch. 26: Resistor networks
12	20 Feb.	Th	Ch. 26: Kirchhoff's rules, RC circuits
13	25 Feb.	Tu	Ch. 26: Power distribution, electrical safety; Ch. 27: Magnetic fields, force, and flux
14	27 Feb.	Th	Ch. 27: Magnetic field applications, magnetic force on current, torque on current loop
15	3 Mar.	Tu	Ch. 27: Hall effect; Ch. 28: Biot-Savart law
16	5 Mar.	Th	Ch. 28: Force between current-carrying conductors, Ampere's law and applications
—	10 Mar.	Tu	<i>No class – Spring Break</i>
—	12 Mar.	Th	<i>No class – Spring Break</i>
17	17 Mar.	Tu	Ch. 28: Magnetic materials; Ch. 29: Faraday's law of induction
18	19 Mar.	Th	Ch. 29: Motional emf, Lenz's law, applications of Faraday's law
	20 Mar.		Exam 2—Chs. 24-27: Friday, 4:00-5:30 p.m., Physics Building Room 102
19	24 Mar.	Tu	Ch. 29: Eddy currents, displacement current;
20	26 Mar	Th	Ch. 30: Inductance, RL circuits
21	31 Mar.	Tu	Ch. 30: Inductance, RLC circuits
22	2 Apr.	Th	Ch. 31: AC circuits
23	7 Apr.	Tu	Ch. 31: Power in AC circuits, transformers/Chap 32

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24	9 Apr.	Th	Ch. 33: Reflection and refraction
25	14 Apr.	Tu	Ch. 33: Snell's law, Huygen's Principle, dispersion, total internal reflection
26	16 Apr.	Th	Ch. 33-34: Geometric Optics
	17 Apr.	Exam 3	Chs. 28-31, Friday, 4:00-5:30 p.m., Physics Building Room 102
27	21 Apr.	Tu	Ch. 34: Image formation by mirrors
28	23 Apr.	Th	Ch. 34: Image formation by refraction
29	28 Apr.	Tu	Review
30	30 Apr.	Th	Review
Final	7 May		Final Exam—Comprehensive—Thursday, 8:00-10:00 a.m., Physics Building Room 102

Core course objectives: In this course, students focus on describing, explaining, and predicting natural phenomena using the scientific method. Strong emphasis is placed on student understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

PHYS 2220 contributes the following core course learning objectives:

(1) Critical thinking

Students will gain the ability to use the knowledge of mathematics and the basic physical laws of nature to solve physics problems. This skill requires creative thinking and innovation to identify and apply appropriate models to analyze physical phenomena.

(2) Effective communication

Students will gain proficiency in communicating ideas effectively in graphical and written form through submission of written homework solutions, examinations, and lab reports; and in oral form through question-answer problem-solving recitation sessions, occasional in-class discussion of concepts and experiments, and in conducting laboratory experiments, where they work together in small groups.

(3) Quantitative skills

Students will interpret and analyze observable facts and data to understand physical systems, and will have extensive practice applying algebra, geometry, trigonometry, and differential and integral calculus in their analyses. In the laboratory exercises, students must measure, compile, organize and analyze numerical data and ultimately draw conclusions about their findings as part of the laboratory objectives.

(4) Teamwork

Students work in small teams to conduct laboratory experiments and interpret the results. Students will need to consider different points of view and work effectively with others to deliver a satisfactory report.

The Student Perceptions of Teaching (SPOT)

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. In addition to SPOT, there will be a brief in-class course survey during the last two weeks of the semester. Near the end of the Spring 2020 semester you will receive an email on from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Please look for the email in your UNT email inbox. Simply click on the link and complete your survey.

After logging in to the my.unt.edu portal, students can access the SPOT survey site by clicking on the SPOT icon. A list of their currently enrolled courses will appear. Students complete each course evaluation independently. During the long terms, the SPOT is open for students to complete two weeks prior to final exams. During the Fall term, the SPOT is open for students to complete six days preceding their final exam. See [SPOT Calendar](#) for specific dates and deadlines.

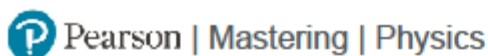
Note to Members of TAMS

The Texas Academy of Mathematics and Science (TAMS) administration has made the followings statement and has asked us to include it in our syllabus for members of the Academy:

“Class attendance and participation is required. Students must be alert, attentive, energetic, and eager to learn. Students who exhibit disruptive behavior or show disrespect to a teacher in the classroom are subject to severe disciplinary sanctions. The Academy does not authorize absences from class. Students must report all absences to the Academic Office within 36 hours of the absence by completing a form in the Academic Office. A student will be assessed 5 disciplinary points for each class absence, unless the absence can be justified. **Faculty will also be reporting absences to the Academic Office.** A student will be assessed 15 disciplinary points for failure to report an absence that is reported by a faculty member.”

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If you are a TAMS student and if you are absent for any reason, you are required to file an absence report with the TAMS Academic Office.



Student Registration Instructions

To register for UNTPHYS2220LIN2020:

1. Go to www.pearson.com/mastering.
2. Under Register, select **Student**.
3. Confirm you have the information needed, then select **OK! Register now**.
4. Enter your instructor's course ID: **lin28283**, and **Continue**.
5. Enter your existing Pearson account **username and password to Sign In**.
You have an account if you have ever used a MyLab or Mastering product.
 - » If you don't have an account, select **Create** and complete the required fields.
6. Select an access option.
 - » Enter the access code that came with your textbook or that you purchased separately from the bookstore.
 - » If available for your course,
 - Buy access using a credit card or PayPal.
 - Get temporary access.

If you're taking another semester of a course, you skip this step.
7. From the You're Done! page, select **Go To My Courses**.
8. On the My Courses page, select the course name **UNTPHYS2220LIN2020** to start your work.

To sign in later:

1. Go to www.pearson.com/mastering.
2. Select **Sign In**.
3. Enter your Pearson account **username and password**, and **Sign In**.
4. Select the course name **UNTPHYS2220LIN2020** to start your work.

To upgrade temporary access to full access:

1. Go to www.pearson.com/mastering.
2. Select **Sign In**.
3. Enter your Pearson account **username and password**, and **Sign In**.
4. Select **Upgrade access** for **UNTPHYS2220LIN2020**.
5. Enter an access code or buy access with a credit card or PayPal.