Electricity and Magnetism

Lecture Section 001, Physics Room 102, MoWeFr 12:00 - 12:50
Recitation-201, MoWe 16:00 - 16:50, Phys 112, TA Hank Atwater (starts 8/25)
Recitation-202, MoWe 14:00 - 14:50, Phys 112 TA Hank Atwater (starts 8/25)
Recitation-203, MoWe 15:00 - 15:50, Phys 112, TA Hank Atwater (starts 8/25)
Recitation-204, TuTh 13:00 - 13:50, Phys 115, TA Hank Atwater (starts 8/26)
Recitation-205, TuTh 14:00 - 14:50, Phys 115, TA Hank Atwater (starts 8/26)

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Office Hours: We 13:00 - 14:00 and by appointment.
TA Office Hours: Mo 13:00 - 14:00

Welcome to UNT! 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 the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT's full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

Textbook and Online homework system:
The recommended textbook is *University Physics,* 15th Edition, by Young and Freedman (Pearson). Other calculus-based introductory physics texts are acceptable; ***the successful student will have a text.*** You are required to obtain access to the Mastering Physics online homework system.
Options with Young/Freedman textbook that include Mastering access:
o Hardcover text with MasteringPhysics access
o 3-hole punched edition with MasteringPhysics access
o MasteringPhysics access including e-book for Young/Freedman

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

Attendance
1) Your class lecture attendance will be recorded at every session. You may miss up to five sessions without penalty. Any absences beyond this limit will be counted, and no excuses will be accepted.
2) Classes will start at the assigned time.
3) University of North Texas' Attendance Policy
4) No cellphone uses in class except an emergence call, or using it to finish the in-class quiz, or taking pictures of writing in blackboard. No earplugs for music except one for hearing aids.
5) Attendance of recitations is required.

Exams:
1) There will be **four exams**. Exam questions will be based on lecture material, material contained in the text, in the homework assignments and recitations. Exams will be comprised of multiple-choice questions (or + problems).
2) There will be no makeup exams.
3) Any student caught cheating will be given a grade of zero for that exam.
4) Questions pertaining to the grading of exam questions and problems must be directed to the instructor in writing **within one week** after the exams were administered and grades were posted online.

Homework:
1) All homework will be posted, collected, and graded via the internet.
2) You must access your assignment online through Canvas, work the problems, and submit your solutions to the server by the due date indicated online.
3) If you have not registered yet, go to Canvas, click "Access Pearson", then select "Open Pearson", and open "MyLab and Mastering". If you have already paid for an access to Phys 1710, use the **same username and password** for the access to Pearson through **Canvas (**Browser Settings: **Pop-ups must be enabled; Cookies must be enabled. I usually use the browser of "Microsoft Edge"):**

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After you setup your account,
a) Go to UNT Canvas
b) Go to Assignment
c) Then click HW XY

4) Homework grading policy: Your homework grade is determined from your Mastering Physics web-based homework score.

Grades:
The course grades will be calculated as follows:
Exam 1 ……..... 15%
Exam 2 ……..... 15%
Exam 3 ……..... 15%
Final Exam 30%
Homework 10%
Class/Recitation Attendance 10%/5%

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

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/ldap 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, and exam expectations.

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. Read through text-book to understand some key concepts.

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

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

Tentative Lecture Contents

Week **Lecture Topics and Readings**

1. Syllabus, Ch. 21: Electrical Charge, Coulomb's law, Electric field, Electric field lines, electric flux
2. Ch. 22: Gauss's law, Applications of Gauss's law, Conductors in electrostatic equilibrium
3. Ch. 23: Electric potential energy, Electric potential, Electric field from potential
4. Ch. 23-24: Electric potential for continuous charge distributions, Equipotential surface, Capacitance, capacitor networks, Capacitors with dielectrics, electric dipoles

   Exam-1: Sep 15
5. Ch. 24 Capacitance, capacitor networks, Capacitors with dielectrics, electric dipoles, Ch. 25: Ohm's law, Resistors, electromotive force, Energy and power in electrical circuits
6. Ch. 25-26. Ohm's law, Resistors, electromotive force, Energy and power in electrical circuits, DC circuits
7. Ch. 26: DC circuits, Resistor networks, Kirchhoff's rules, RC circuits, household wiring, electrical safety
8. Ch. 27: Magnetic fields, magnetic force on charged particles/wires, Torque on current loops, Magnetic dipoles, Motion of charged particles in magnetic fields, Hall effect

   Exam-2: Oct 13
9. Ch. 28: Biot-Savart law, Force between current-carrying conductors, Force between current-carrying conductors, Gauss's law for magnetism
10. Ch. 28: Gauss's law for magnetism, Ampere's law, Ch. 29: Faraday's law of induction, Lenz's law, Applications of Faraday's law
11. Ch. 29: Faraday's law of induction, Lenz's law, Applications of Faraday's law, Ch. 30: Inductance, RL circuits, energy in magnetic field

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12. Ch. 30: RL circuits, LC and RLC circuits, Ch. 31: Phasor diagrams, resistance and reactance
    Exam-3: Nov 10
13. Ch. 31: Power in AC and Transformers
14. Ch. 32: Maxwell's Equations, Electromagnetic Waves, Energy and Momentum of Electromagnetic Waves
15. Review

*No class on Sep 1 (Labor day) and Nov 24, 26, 28 (Thanksgiving break)

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.

Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course. The survey will be made available during weeks 13, 14 and 15 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no- reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the SPOT website (http://spot.unt.edu/) or email spot@unt.edu.

Class Participation

To enhance learning, pursue the following strategies:

(1) Read the text chapter within the forty-eight hours prior to the lecture.
(2) Work the assigned problems only after you have read and reviewed the material.
(3) Come to the session prepared: bring a calculator, your text book, participate and take full advantage of the learning experience.
(4) Work extra practice problems, such as from the end-of-chapter problems in the text**.**

UNT Policies

Academic Integrity Policy

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. [Insert specific sanction or academic penalty for specific academic integrity violation.

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ADA Policy
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 (https://disability.unt.edu/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)
The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

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.

Retention of Student Records
Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student's records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy. See UNT Policy 10.10, Records Management and Retention for additional information.

Acceptable Student Behavior
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 electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's Code of Student Conduct (https://deanofstudents.unt.edu/conduct) to learn more.

Survivor Advocacy
UNT is committed to providing a safe learning environment free of all forms of sexual misconduct. Federal laws and UNT policies prohibit discrimination on the basis of sex as well as 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. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-5652648.