South Plains College
Common Course Syllabus: PHYS 2426
Revised 01/11/2022

Department: Science

Discipline: Physics

Course Number: PHYS 2426

Course Title: Principles of Physics II

Available Formats: conventional

Campuses: Levelland

Instructor:
David Hobbs
Office: S67
Office Hours: TT 1:30 – 4:00 pm, F 8:30 – 11:30 am
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Course Description: Principles of physics for science, computer science, and engineering majors, using calculus, involving the principles of electricity and magnetism, including circuits, electromagnetism, waves, sound, light, and optics. Laboratory experiments supporting theoretical principles of electricity and magnetism, including circuits, electromagnetism, waves, sound, light, and optics; experimental design, data collection and analysis, and preparation of laboratory reports.

Prerequisite: PHYS 2425 Principles of Physics I and MATH 2414 Calculus II

Credit: 4 **Lecture:** 3 **Lab:** 3

Textbook: *University Physics*, OpenStax, https://openstax.org/subjects/science

Supplies: Scientific Calculator, Laboratory Notebook (available from the bookstore)

This course partially satisfies a Core Curriculum Requirement:
Life and Physical Sciences Foundational Component Area (030)

Core Curriculum Objectives addressed:

- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions
- **Teamwork**—to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Student Learning Outcomes:

Lecture Learning Outcomes - Upon successful completion of this course, students will:

1. Articulate the fundamental concepts of electricity and electromagnetism, including electrostatic potential energy, electrostatic potential, potential difference, magnetic field, induction, and Maxwell's Laws.
2. State the general nature of electrical forces and electrical charges, and their relationship to electrical current.
3. Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.
4. Apply Kirchhoff's Laws to analysis of circuits with potential sources, capacitance, and resistance, including parallel and series capacitance and resistance.
5. Calculate the force on a charged particle between the plates of a parallel-plate capacitor.
6. Apply Ohm's law to the solution of problems.
7. Describe the effects of static charge on nearby materials in terms of Coulomb's Law.
8. Use Faraday's and Lenz's laws to find the electromotive forces.
9. Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.
10. Articulate the principles of reflection, refraction, diffraction, interference and superposition of waves.
11. Solve real-world problems involving optics, lenses, and mirrors.

Lab Learning Outcomes - Upon successful completion of this course, students will:

1. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.
2. Conduct basic laboratory experiments involving electricity and magnetism.
3. Relate physical observations and measurements involving electricity and magnetism to theoretical principles.
4. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
5. Design fundamental experiments involving principles of electricity and magnetism.
6. Identify appropriate sources of information for conducting laboratory experiments involving electricity and magnetism.

Student Learning Outcomes Assessment: Selected questions on the comprehensive final exam will assess how well students have met targeted student learning outcomes.

Course Evaluation: Student grades will be based on daily work (problem solving sessions and lab assignments), homework and tests, and a comprehensive final exam. Final grades will be assigned based on overall point total, using the point values shown below:

Task	Code	Points
Daily Work	D	20
HW & Tests	T	60
Final Exam	F	20

The letter grades will be based on a fixed scale as follows:

A: 89.5 – 100 B: 79.5 – 89.5 C: 69.5 – 79.5 D: 59.5 – 69.5 F: below 59.5

Borderline cases (within 0.5 points of the break) will be decided based on class participation.

Attendance Policy: Attendance and effort are vital to success in this course. Class attendance keeps you well connected to the course and gives you opportunities to ask questions and clear up confusions. Therefore, students are expected to be in attendance for every class session. Students who stop attending class will *not* be administratively dropped. *You* must complete the appropriate drop procedure or you may end up receiving a failing grade in the course at the end of the semester.

Daily Work: Daily work consists of in-class practice with feedback (problem solving sessions and lab). These activities are meant to be formative exercises and are graded primarily on participation. Their purpose is to help develop understanding of the concepts and principles, to prepare you for the tests, and provide opportunities to practice making experimental observations and maintaining a lab notebook.

Daily Work Grade Determination: Your daily work grade will be determined as follows:

Problem Solving Sessions: 10 points
Lab: 10 points

Homework: Do your homework! There is no substitute. Students who don't put in a good effort often fail the course. Homework will be assigned and detailed solutions written and handed in for review. Due dates will normally be one week after completion of each chapter. Late homework gets no credit! Homework will be scored uniformly for a maximum of 20 points (percentage of problems correct*20 points).

Tests: Three tests will be given during the semester as shown on the course calendar. Each test will be worth 20 points. There will be no make-up tests given, so a test missed counts as zero. However, your lowest test grade will be replaced automatically by a greater cumulative homework score at the end of the semester. Thus, in addition to demonstrating your grasp of the subject and helping you to prepare for tests, a good homework grade provides "insurance" against a low or missing test grade.

Final Exam: A comprehensive final exam will be given during the scheduled two-hour final exam time. The final exam is worth 20 points. See the course calendar for the day and time.

Tips for Doing Well

- Attend classes and ask questions. If you have a question from a previous class, send me a quick email ahead of the next class and I will endeavor to respond, as time permits.
- Read ahead each day. Frame questions from your readings.
- Do the homework. Homework helps you internalize what you are learning and gives practice. Don't skimp! Students who try to get by without doing homework often fail the course. And your homework grade gives "insurance" against a low test grade.
- Time commitment. Learning physics is a time intensive process. Be sure to set aside enough time for both studying the textbook thoroughly and working homework. How much time you need will depend on your prior preparation. It's probably fair to say that most students underestimate the time commitment needed to excel.
- Meet individually with me. Don't hesitate to ask me for help. That's my job! To facilitate the most effective help, bring a list of questions you have and any attempted work with you when meeting with me.
- Online resources. There is a plethora of online physics resources. Hyperphysics (http://hyperphysics.phy-astr.gsu.edu/) summarizes many course topics. Video tutorials can be viewed at Khan Academy (https://www.khanacademy.org/science/physics).

Plagiarism and Cheating: Students are expected to do their own work on all projects, quizzes, assignments, examinations, and papers. Failure to comply with this policy will result in an F (grade of zero) for the assignment and can result in an F for the course if circumstances warrant.

Plagiarism violations include, but are not limited to, the following:

1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:

1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another's work during an examination or on a homework assignment;
8. Rewriting another student's work in Peer Editing so that the writing is no longer the original student's;
9. Taking pictures of a test, test answers, or someone else's paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others' behavior that is rude, disruptive, intimidating, aggressive, or demeaning**.** Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Diversity Statement: In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disability Statement: Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Nondiscrimination Policy: South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Title IX Pregnancy Accommodations Statement: If you are pregnant, or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To activate accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact the Director of Health and Wellness at 806-716-2362 or email cgilster@southplainscollege.edu for assistance.

Covid Statement:
If you are experiencing any of the following symptoms please do not attend class and either seek medical attention or get tested for COVID-19.

- Cough, shortness of breath, difficulty breathing
- Fever or chills
- Muscles or body aches
- Vomiting or diarrhea
- New loss of taste and smell

Please also notify DeEtte Edens, BSN, RN, Associate Director of Health & Wellness, at dedens@southplainscollege.edu or 806-716-2376.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

Calendar

Phys 2426.001 Spring 2022

Week	Readings	Topics
1 01/16 - 01/22		Class Introduction and Physics 1 Review
2 01/23 – 01/29	OpenStax University Physics, Vol. 2 Chap 5	Electric Charges and Electric Fields
3 1/30 – 02/05	OpenStax University Physics, Vol. 2 Chap 6	Gauss's Law
4 02/06 – 02/12	OpenStax University Physics, Vol. 2 Chap 7	Electric Potential
5 02/13 – 02/19	OpenStax University Physics, Vol. 2 Chap 8	Capacitance
6 02/20 – 02/26	OpenStax University Physics, Vol. 2 Chap 9	Current and Resistance **Test 1 on 02/23**
7 02/27 – 03/05	OpenStax University Physics, Vol. 2 Chap 10	Direct-Current Circuits
8 03/06 – 03/12	OpenStax University Physics, Vol. 2 Chap 11	Magnetic Forces and Fields
Spring Break 03/13 – 03/19		Spring Break – No Classes for week of 03/13/2022 through 03/19/2022
9 03/20 – 03/26	OpenStax University Physics, Vol. 2 Chap 12	Sources of Magnetic Field
10 03/27 – 04/02	OpenStax University Physics, Vol. 2 Chap 13	Electromagnetic Induction **Test 2 on 03/30**
11 04/03 – 04/09	OpenStax University Physics, Vol. 2 Chap 14 and Chap 15	Inductance, Alternating-Current Circuits
12 04/10 – 04/16	OpenStax University Physics, Vol. 2 Chap 16	Electromagnetic Waves
13 04/17 – 04/23	OpenStax University Physics, Vol. 3 Chap 1	The Nature of Light
14 04/24 – 04/30	OpenStax University Physics, Vol. 3 Chap 2	Geometric Optics and Image Formation **Test 3 on 04/27**
15 05/01 – 05/07	OpenStax University Physics, Vol. 3 Chap 3 and Chap 4	Interference and Diffraction
16 05/08 – 05/14		Final Exam Week **Final Exam on 05/09**