

**South Plains College**  
**Common Course Syllabus: PHYS 1410**  
**Revised 01/06/2025**

**Department:** Science

**Discipline:** Physics

**Course Number:** PHYS 1410

**Course Title:** Elementary Physics

**Available Formats:** conventional

**Campuses:** Levelland

**Instructor:**

David Hobbs

Office: S67

Office Hours: MW 1:00 – 2:00 pm, TT 1:30 – 3:30 pm, F 1:00 – 3:00 pm

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**Course Description:** Conceptual level survey of topics in physics intended for liberal arts and other non-science majors.

**Prerequisite:** There are no prerequisites for this course, however you will be expected both on the homework and in the exams to be able to perform simple mathematical calculations. Examples of the mathematical concepts we will use in this course are scientific notation, multiplying and dividing powers of 10, converting between different metric units, rearranging and solving simple equations. It will be assumed that you are proficient in math at the level of high school algebra.

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

**Textbook:** *Conceptual Physics, 13<sup>th</sup> Edition* by Paul G. Hewitt (Pearson, 2021).

The textbook and Mastering Physics learning platform will be available through Blackboard.

**Supplies:** Scientific Calculator

**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:**

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

1. Distinguish between displacement, velocity, and acceleration.
2. Solve simple problems involving uniform motion, uniformly accelerated motion, uniform circular motion, and projectile motion.
3. State Newton's Laws of Motion, explain the meaning of each, and identify applications of each.
4. Apply Newton's laws of motion to relate forces to motion for simple physical cases.
5. Define momentum and solve simple problems involving conservation of momentum.
6. Identify types of energy in a system and solve simple problems involving conservation of energy.
7. Define angular momentum and solve simple problems involving conservation of angular momentum.
8. Calculate gravitational forces using Newton's law of universal gravitation.
9. Describe the basic structure of an atom in terms of protons, neutrons, and electrons.
10. Make simple calculations involving changes in temperature as well as phase changes when systems at different temperatures interact.
11. Describe and calculate basic properties of waves such as frequency, wavelength, and amplitude.
12. Discuss wave interference and the conditions for constructive and destructive interference.
13. Describe standing waves and determine the frequencies of the harmonics.
14. Discuss electric charge and the role it plays in atomic structure.
15. Calculate electrical forces using Coulomb's law.
16. Describe electric field and discuss electrical interactions in terms of electric field.
17. Discuss simple electrical circuits and make calculations using Ohm's law applied to series and parallel circuits.
18. Describe magnetic field and discuss interactions of magnetic fields with moving charges.
19. Discuss and apply Faraday's law of electromagnetic induction.
20. Relate changing magnetic fields to induced electric fields.
21. Describe electromagnetic waves in terms of electric and magnetic fields and electromagnetic induction.
22. Discuss the spectrum of electromagnetic waves from radio waves to x-rays.
23. Discuss refraction and image formation with thin lenses. Make simple calculations using the thin lens equation.
24. Discuss diffraction and interference and how they arise based on superposition and Huygens' Principle.
25. Make simple calculations related to the photoelectric effect and the Bohr model of the hydrogen atom.
26. State the Pauli Exclusion Principle and specify its implications for atomic structure.
27. Discuss how quantum mechanics explains the structure of the periodic table.
28. Describe the basic structure of a nucleus and explain the meaning of different isotopes.
29. Recall the three basic types of radioactivity and describe some properties of each.
30. Use radioactive half-life in simple calculations.
31. Describe the basic principles of radioactive dating.
32. Discuss the use of nuclear fission in electric power generation.

**Student Learning Outcomes Assessment:** Selected questions on tests will assess how well students have met targeted student learning outcomes.

**Course Evaluation:** Student grades will be based on daily work, homework, and four tests. Final grades will be assigned based on the percentages shown below:

Task	Weight
Daily Work	25%
HW & Tests	75%

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.

**Late Work:** Late work will not be accepted.

**Extra Credit:** This course will not include any extra credit opportunities.

**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 with excessive absences (more than 5) will be administratively dropped from the class. It is the student's responsibility to know how many absences they have accumulated.

**Dropping a Course:** Students may drop courses through Texan Connect, the Admissions and Records Office, or Advising and Testing Center through the late registration period.

After late registration has closed, a student must complete the online [Student Initiated Drop Request](#) to drop a course.

Students may also drop courses in person at any campus location by completing a Student Initiated Drop Form. Complete a [Student Initiated Drop Form](#) and return the signed form to the Levelland Admissions and Records Office, the Student Support Center at the Lubbock Downtown Center, the Lubbock Career and Technical Center, or Plainview Center. You must have a picture ID to complete the drop.

A mark of "W" will be given for student-initiated drops that occur prior to and through the last day to drop as indicated in the online Academic Calendar found here:

<https://www.southplainscollege.edu/academiccalendar/index.php>.

**Daily Work:** Daily work consists of reading quizzes, in-class practice (problem solving with feedback), 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 and to prepare you for the tests.

**Homework:** Do your homework! There is no substitute. Students who don't put in a good effort often struggle in the course. Homework will be assigned and graded online. A better semester average homework grade will replace your lowest test score. 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.

**Tests:** Four tests will be given during the semester as shown on the course calendar.

Make-up tests will be given only in extreme circumstances. The first missed test will be replaced by your semester average homework score. A second missed test can be made up only if both missed tests were due to serious unavoidable medical issues that were both properly documented – see below.

Missing a test should only be for serious unavoidable medical issues and should not be for trivial reasons. You should notify the instructor **before** the missed test, if at all possible. In any case, you must notify the instructor of the reason for missing the test within 24 hours of the test date.

Failure to make this notification means making up the test will not be allowed under any circumstances. Proper documentation must be provided before a make-up test will be scheduled.

**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.

**Syllabus Statements:** For information about Artificial Intelligence, Disabilities, Non-Discrimination, Intellectual Exchange, Title IX Pregnancy Accommodations, CARE (Campus Assessment, Response, and Evaluation) Team, Campus Concealed Carry, and COVID-19, please use this link: <https://www.southplainscollege.edu/syllabusstatements/>.

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 1410

Spring 2025

Week	Monday		Wednesday	
	Readings	Topics	Readings	Topics
1	01/13	Course Intro – Blackboard, Mastering Physics, SI Units, Significant Figures  Lab1 – Measurement and Uncertainty	01/15  <b>Ch2</b>	Newton’s First Law of Motion - Inertia  Lab2 – Scientific Notation
2	01/20	Martin Luther King Day – No Class	01/22  <b>Ch3</b>	Linear Motion  Lab3 – Free Fall
3	01/27  <b>Ch4</b>	Newton’s Second Law of Motion  Lab4 – Problem-Solving with N2L	01/29  <b>Ch5</b>	Newton’s Third Law of Motion  Lab5 – Review for Test 1
4	02/03	<b>Test 1 – Chapters 2-5</b>	02/05  <b>Ch6</b>	Momentum  Lab6 – impulse/Momentum
5	02/10  <b>Ch7</b>	Energy  Lab7 – Energy Conservation	02/12  <b>Ch8</b>	Rotational Motion  Lab8 – Rotational Inertia
6	02/17  <b>Ch9</b>	Gravity  Lab9 – Problem-Solving with COE	02/19  <b>Ch10</b>	Projectile and Satellite Motion  Lab10 – Projectile Motion
7	02/24  <b>Ch11</b>	The Atomic Nature of Matter  Lab11 – Size of a Molecule	02/26  <b>Ch15</b>	Temperature and Heat  Lab12 – Review for Test 2
8	03/03	<b>Test 2 – Chapters 6-11</b>	03/05  <b>Ch17</b>	Change of Phase  Lab13 – Heat of Fusion for Ice
9	03/10  <b>Ch19</b>	Vibrations and Waves  Lab14 – Simple Pendulum	03/12  <b>Ch22</b>	Electrostatics  Lab15 – Frictional Charging
	03/17	Spring Break – No Class	03/19	Spring Break – No Class
10	03/24  <b>Ch23</b>	Electric Current  Lab16 – Simple Circuits	03/26  <b>Ch24</b>	Magnetism  Lab17 – Mapping Magnetic Fields
11	03/31  <b>Ch25</b>	Electromagnetic Induction  Lab18 – Faraday’s Law	04/02  <b>Ch26</b>	Properties of Light  Lab19 – Review for Test 3
12	04/07	<b>Test 3 – Chapters 15, 17, 19, 22-25</b>	04/09  <b>Ch28</b>	Reflection and Refraction  Lab20 – Thin Lenses
13	04/14  <b>Ch29</b>	Light Waves  Lab21 – Interference of Light	04/16  <b>Ch30</b>	Light Emission  Lab22 – Atomic Spectra
14	04/21  <b>Ch31</b>	Light Quanta  Lab23 – Photoelectric Effect	04/23  <b>Ch32</b>	The Atom and the Quantum  Lab24 – Periodic Table
15	04/28  <b>Ch33</b>	The Atomic Nucleus and Radioactivity  Lab25 – Half-Life	04/30  <b>Ch34</b>	Nuclear Fission and Fusion  Lab26 – Review for Test 4
16	05/05		05/07	<b>Test 4 – Chapters 26, 28-34 8:00 – 10:00 am</b>

This schedule may be subject to change. Any necessary changes will be announced in class and through Blackboard.