

South Plains College
Common Course Syllabus: PHYS 1410
Revised Spring 2020

Department: Science
Discipline: Physics
Course Number: PHYS 1410.001
Course Title: Elementary Physics
Available Formats: conventional
Campus: Levelland

Instructor: Dr. Kimberly Bouldin
Office: S106 Levelland campus, R228 Reese campus
Office hours: **MW** 12:30-1pm Levelland, 2-2:30 Reese (R228),
TTh 10-11am & 12:30-1pm (Levelland) **F** 9am-noon (Levelland), *other times by appointment*
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SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE.

Course Room: S104
Course Description: Conceptual level survey of topics in physics intended to acquaint liberal arts and other non-science majors with the basic laws and vocabulary of physics. A minimum level of mathematics is used.

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

Course Textbook: Conceptual Physics by Paul G. Hewitt, 12th edition, required

Supplies: Students will each need a three ring binder, a spiral notebook that will fit inside the binder, loose leaf notebook paper, a scientific calculator (not a phone), and writing utensils.

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

Core Curriculum Objectives addressed:

Communication 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 skills--to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

Teamwork skills--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:

Upon successful completion of this course, students shall be able to:

1. Distinguish between displacement, velocity, and acceleration
2. Solve simple problems involving uniform motion
3. Apply Newton's laws of motion to various physical examples
4. Understand the concepts of momentum and the conservation of momentum
5. Understand the concepts of energy and the conservation of energy
6. Describe the different phases of matter from an atomic perspective
7. Understand how depth of fluid affects pressure and force
8. Understand the concepts of density and buoyant force
9. Discuss the first law of thermodynamics and various means of heat transfer
10. Make simple calculations involving changes in temperature and phase when different systems interact
11. Understand the forces that give rise to oscillatory motion
12. Describe and calculate the basic properties of waves
13. Distinguish between different types of waves and wave phenomena
14. Discuss electric charge and the role it plays in atomic structure
15. Calculate electric forces using Coulomb's law
16. Describe electric field and its effects
17. Understand simple circuits and make calculations using Ohm's law
18. Describe magnetic field and its effects
19. Explain the spectrum of electromagnetic waves and the properties of blackbody radiation
20. Understand image formation using mirrors and lenses
21. Calculate the image position and magnification produced by a simple thin lens
22. Discuss various optical phenomena such as reflection, refraction and dispersion of light
23. Discuss and perform simple calculations related to the quantum nature of matter
24. Describe the functioning of a laser
25. Explain the basic structure of a nucleus
26. Distinguish between the three basic types of radioactivity
27. Use radioactive half-life in simple calculations
28. Describe the basic principles of radioactive dating
29. List the four fundamental interactions and give examples of each
30. Understand the basic concepts of the theory of relativity

Student Learning Outcomes Assessment: A pre- and post-test will be used to determine the extent of improvement that the students have gained during the semester.

Breakdown of Grading:

Attendance/participation/homework	10%
Quizzes	15%
Lab exercises	10%
Exam 1	15%
Exam 2	15%
Midterm	15%
Final	20%

Grading scale:

100---A---90, 89---B---80, 79---C---70, 69---D---60, 59---F---0

(Bonus points may be given for assignments and activities that are considered above and beyond course requirements. *Students are strongly encouraged to attempt all bonus assignments.*)

Attendance Policy:

Attendance in class is required at South Plains College. If you should have to be absent for class for any reason, please call or text a fellow student in the class to see what you have missed. In addition, send the instructor an email or call as soon as possible after an absence or before an absence if you have a planned conflict. Up to five absences per semester are allowed for any reason. Whenever you have 6 total absences, the instructor may withdraw you from the course with a grade of X or F. If your absence is due to a school sponsored event, I will give you an excused absence. (This means that any attendance/participation and/or lab grades will not count for that day. You will still, however, be responsible for any other assignments due or assigned that day.) If you stop attending class, you should go through the procedure for dropping a course to obtain a grade of W or U. (See the South Plains College General Catalog for more details.) Attendance and effort are the most important activities for success in this course. Please schedule work, doctor appointments, parent-teacher conferences, university advising sessions, etc. at a time other than your class time. For conflicts occurring due to another class, please see the instructor.

Cell Phones: Use of cell phones during class will be limited to constructive, course-related usage. Students who become a distraction to anyone during class, by using his/her phone or in any other manner, will be given a one-time warning. After that student's second offense (whether it be on the same day as the first offense or not), the student will be excused from that day's class. This will count as one of the student's five absences, in addition to the student receiving a zero for attendance for that day. **(If a student is expecting an important call, please inform the instructor at the beginning of class.)**

Academic Integrity

It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. Classroom behavior that is not conducive to learning will be dealt with according to the guidelines set forth on the South Plains College Catalog. The attempt of

any student to present as his or her own work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension.

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.

Disabilities 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.

Non-Discrimination 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 Crystal Gilster, Director of Health and Wellness at 806-716-2362 or email cgilster@southplainscollege.edu for assistance.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked Questions, please refer to the Campus Carry page at: <https://www.southplainscollege.edu/campuscarry.php>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

PHYS 1410 Elementary Physics Tentative Schedule Spring Semester 2020

Day 1 Jan 13 Introduction, Ch 1 About Science, lab 1-Fresnel lens demonstration, Size of Sun (weather permitting)	Day 18 March 23 Ch 22, lab 11- 2-D projectile motion <i>(Spring Break March 16-20)</i>
Day 2 Jan 15 Ch 1 cont , lab 2-Size of Solar System	Day 19 March 25 Ch 22 cont
Day 3 Jan 22 Ch 2, video-Nova: The Sun (season 8) <i>(No class Jan 20 for MLK, Jr Day)</i>	Day 20 March 30 Ch 23, lab 12- Electrostatics, Quiz 3 on Ch 9-10 and Ch 22
Day 4 Jan 27 Ch 2 cont, lab 3-Rocket 1-D (weather permitting)	Day 21 April 1 Ch 23 cont, lab 13- Van de Graffe
Day 5 Jan 29 Ch 3, Nova video-Mathematical Mysteries	Day 22 April 6 Ch 23 cont, lab 14- simplest motor
Day 6 Feb 3 Ch 4, lab 4-How fast are you/push me pull you, Quiz 1	Day 23 April 8 Ch 24, lab 15-simple motor
Day 7 Feb 5 Review for Exam 1, draw midterm topics, Ch 5, lab 5-water bottle rocket demo	Day 24 April 15 Ch 24 cont, Flatland video <i>(No class April 13 for Easter)</i>
Day 8 Feb 10 Exam 1 on Ch 1-4	Day 25 April 20 lab 14-Hot Air Balloon lab, wave demonstrations
Day 9 Feb 12 Ch 6, lab 6-Gameroom: momentum lab (<i>wear comfortable clothes</i>)	Day 26 April 22 Midterm presentations Day 1
Day 10 Feb 17 Ch 7, lab 7-marble roller coaster	Day 27 April 27 Midterm presentations Day 2
Day 11 Feb 19 Ch 7 cont, lab 7- Force	Day 28 April 29 Quiz 4 over oral presentations, review for Final Exam
Day 12 Feb 24 Ch 8, lab 8-Rotation	Day 29 May 4 Final Exam 10:15am-12:15 pm, S104
Day 13 Feb 26 Ch 8 cont, lab 9-Measuring g	
Day 14 March 2 Ch 9, Quiz 2 on Ch 5-7	
Day 15 March 4 Ch 9 cont/review for Exam 2	
Day 16 March 9 Exam 2 on Ch 5-8	
Day 17 March 11 Ch 10, lab 10-ellipses, phases of the moon	