

South Plains College

Fall 2019 Semester

Course Syllabus

PHYS 1410.001 Elementary Physics

Instructor: Dr. Kimberly Bouldin

Office: S106, Levelland campus

Office hours: **MW** 12:30-1pm Levelland, 2-2:30 Reese (R226),

TTh 10-11am, 12:30-1pm, **F** 9am-noon, *other times by appointment*

Office phone number: 806-716-2950

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SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE.

Course Room: S104

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

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.

Note: This course satisfies a **030 Life and Physical Sciences** Core Curriculum requirement.

Credit hours: 4

Lecture hours: 3

Lab hours: 3

Materials Needed: 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.

Course Learning Objectives

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

Core Skills Developed in this Course

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.

Breakdown of Grading:

Attendance and labs	15%
Quizzes and Homework	15%
Exam 1	15%
Exam 2	15%
Midterm	20%
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

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 excused absences** per semester are allowed for any reason. Whenever you have six total absences, the instructor may withdraw you from the course with a grade of X or F. I do not distinguish between excused and unexcused absences. 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 doctor appointments, parent-teacher conferences, university advising sessions, etc. at a time other than your class time.

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 excused 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.

4.1.1.1. 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.

4.1.1.2. 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.

4.1.1.3. Non-Discrimination Statement

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.

4.1.1.4 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.

4.1.1.5 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 Fall Semester 2019

Day 1 Aug 26 Intro, Ch 1 About Science, lab 1 – Size of Sun/Solar System	Day 16 Oct 16 Ch 24-25 Magnetism/Electromagnetic Induction, lab 14 – simplest motor
Day 2 Aug 28 Ch 2 Newton's 1 st Law of Motion— Inertia, lab 2—inertia lab, phases of the moon lab	Day 17 Oct 21 lab 15 – Simple motor, other magnetic/induction activities
Day 3 Sept 2 Labor Day, no classes	Day 18 Oct 23 Ch 26 Properties of Light, lab 16 – Diffraction and Interference patterns
Day 4 Sept 4 Ch 3 Linear Motion, lab 3 – 1-D Rocket lab	Day 19 Oct 28 Ch 27 Color, lab 17 – color wheel, Quiz 3
Day 5 Sept 9 Ch 4-5 Newton's 2 nd and 3 rd laws of motion, lab 4 – Force/Action-Reaction	Day 20 Oct 30 Ch 28 Reflection and Refraction, lab 18 – mirrors/lenses
Day 6 Sept 11 Ch 6 Momentum, lab 5 – at the Game Room	Day 21 Nov 4 Ch 29-31 Light Waves, Light Emission, and Light Quanta
Day 7 Sept 16 Ch 7 Energy, lab 6 – posterboard rollercoasters	Day 22 Nov 6 lab 19 – Cardboard tube spectroscope, review for Exam 2
Day 8 Sept 18 Ch 8 Rotational Motion, lab 7 – Incredible Rotating Student/Torque Wrench, Quiz 1	Day 23 Nov 11 Flatland video, Exam 2
Day 9 Sept 23 Ch 9 Gravity, lab 8 – Calculate g	Day 24 Nov 13 Ch 32-33 The Atom and the Quantum/The Atomic Nucleus and Radioactivity, lab 20 – half-life
Day 10 Sept 25 Ch 10 Projectile and Satellite Motion, lab 9 – 2-D/Range Rocket lab, review for Exam 1	Day 25 Nov 18 Ch 34 Nuclear Fission and Fusion, lab 21 – Make your own bubble chamber
Day 11 Sept 30 lab 10 – Hot air balloons, Exam 1	Day 26 Nov 20 Oral Midterm Presentations Day 1
Day 12 Oct 2 Ch 19 Vibrations and Waves, lab 11—wave lab, ripple tank demo	Day 27 Nov 25 Oral Midterm Presentations Day 2
Day 13 Oct 7 Ch 20-21 Sound/Musical sounds, lab 12 – Spring-mass lab, music lab	Day 28 Nov 27 Thanksgiving break, no classes
Day 14 Oct 9 Ch 22 Electrostatics, lab 13 – electrostatics, Van de Graff generator	Day 29 Dec 2 Ch 35 Special theory of Relativity, Quiz 4 over Midterm Presentations
Day 15 Oct 14 Ch 23 Electric current, Quiz 2	Day 30 Dec 4 Ch 36 General Theory of Relativity, video on Relativity and Einstein, Review for Final exam
Final Exam will be on Monday, December 9 from 10:15am – 12:15pm in S104.	