

# South Plains College

## Common Course Syllabus: PHYS 1410

### Revised Fall 2020

**Department:** Science

**Discipline:** Physics

**Course Number:** PHYS 1410.001

**Course Title:** Elementary Physics

**Available Formats:** flex

**Campus:** Levelland

**Instructor:** Dr. Kimberly Bouldin

**Office:** TA227 Levelland campus, R228 Reese campus

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

TTh 10-11am & 12:30-1pm (Levelland), F 9am-11am (Zoom), F 11am-noon (Levelland), *other times by appointment*

**Office phone number:** 806-716-2950

**Email:** [KBouldin@southplainscollege.edu](mailto:KBouldin@southplainscollege.edu)

#### SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE.

**Course Room:** TA218

**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, 12<sup>th</sup> 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. For in-class lab activities, each student will need an outdoor blanket or lawn chair.

**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:**

Lab exercises/homework	10%
Quiz average	10%
Exam 1	25%
Exam 2	25%
Midterm project	25%
Final	5%

**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 this class will be taken from completed assignments. Everything done face-to-face in class will be recorded and posted on Blackboard. If a student feels ill with ANY symptoms of COVID-19, the student will be required to stay home and complete the assignments for the day at home.

It is the policy of South Plains College for the Fall 2020 semester that as a condition of on-campus enrollment, all students are required to engage in safe behaviors to avoid the spread of COVID-19 in the SPC community. Such behaviors specifically include the requirement that all students properly wear CDC-compliant face coverings while in SPC buildings including in classrooms, labs, hallways, and restrooms. Failure to comply with this policy may result in dismissal from the current class session. If the student refuses to leave the classroom or lab after being dismissed, the student may be referred to the Dean of Students on the Levelland campus or the Dean/Director of external centers for Student Code of Conduct Violation.

**You should always check Blackboard before coming to class in order to make sure that class has not been cancelled due to the instructor's illness or other reasons.**

**Computer/Software requirements**

**Minimum Computer Requirements:**

1. Personal computer with a 1 GHz Pentium processor and at least 512 MB of RAM memory, a minimum 5 GB of free hard drive, running Windows 7 / MacOS 10.8 or later (Windows 10 / MacOS 10.12 recommended).
2. Web Browser: Google Chrome seems to work the best with Blackboard and HOL.
3. A high speed internet connection of 5+ Mbps.
4. Microsoft Office and Microsoft PowerPoint and Word software (a recent version, preferably 2016 or higher).
5. Windows Media Player (the latest version).

6. Soundcard and functioning speakers.
7. Knowledge of how to navigate Google Chrome web pages and how to deal with pop-up blockers and other devices and warnings on Google Chrome.
8. Knowledge of how to download files from the Google Chrome and find them on your computer once they are downloaded.
9. Knowledge of basic operations of Microsoft Word and Microsoft PowerPoint.
10. Knowledge of how to view and adjust videos with Windows Media Player.

**Additional notes on technology:**

I will respond to individual emails as quickly as I can. I will always send a reply email when an assignment is sent through email to let the student know that I have received it. If you send me something through email, and you do not receive a response within 2 days, please resend it. I will always at least touch base with you within a 2-day time period unless I am ill.

Also, a student will not be punished in the even that Blackboard or an SPC server is down when an assignment is due. If you need to print, turn something in, or access something online, please try to do so ahead of time and not at the last minute in order to avoid this situation.

**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](mailto: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 Fall Semester 2020

<p>Week 1 Aug 24, 26 Introduction, Ch 1            Lab 1—Fresnel lens demonstration, Size of the Sun (weather permitting)</p>	<p>Week 9 Oct 19, 21 Ch 6            Lab 6—momentum            HW Ch 5 due by Oct 21</p>
<p>Week 2 Aug 31, Sept 2 Ch 1 cont            Lab 2—Size of the Solar System (outside if weather permits)</p>	<p>Week 10 Oct 26, 28 Ch 7            Lab 7—marble roller coaster/Conservation of Energy            HW Ch 6 due by Oct 28</p>
<p>Week 3 Sept 7, 9 Labor Day Holiday            Choose Midterm Project topic on Blackboard            HW Ch 1 due by Sept 9</p>	<p>Week 11 Nov 2, 4 Ch 8            Lab 8—Force, ellipses, phases of the moon            HW Ch 7 due by Nov 4</p>
<p>Week 4 Sept 14, 16 Ch 2            Lab 3—Hot Air Balloons            Nova video—Mathematical Mysteries</p>	<p>Week 12 Nov 9, 11 Ch 9            Lab 9—electrostatics/motors            Review for <b>Exam 2</b>            HW Ch 8 due by Nov 11</p>
<p>Week 5 Sept 21, 23 Ch 3            Lab 4—Rocket 1-D (weather permitting)  <b>Quiz 1</b> over Ch 1-2            HW Ch 2 due by Sept 23</p>	<p>Week 13 Nov 16, 18 Ch 10  <b>Exam 2</b> over Ch 5-9            HW Ch 9 due by Nov 18</p>
<p>Week 6 Sept 28, 30 Ch 4            Lab 5—How fast are you/Push me pull you            HW Ch 3 due by Sept 30            Review for <b>Exam 1</b></p>	<p>Week 14 Nov 23, 25 Ch 22            HW Ch 10 due by Nov 25  <b>Midterm projects due by Nov 25</b></p>
<p>Week 7 Oct 5, 7  <b>Exam 1</b> over Ch 1-4            HW Ch 4 due by Oct 7</p>	<p>Week 15 Nov 30, Dec 2 Ch 23 &amp; 24            Open note <b>Quiz 2</b> on Midterm projects            Wave demonstrations            HW Ch 22 due by Dec 2            Bonus book reports due by Dec 2.</p>
<p>Week 8 Oct 12, 14 Ch 5            Lab 5—Water bottle rocket demo, Rocket 2-D (weather permitting)</p>	<p><b>Final exam</b> will be posted on Blackboard by the morning of Dec 7 and will be due by Dec 7 at midnight.</p>