

South Plains College
Common Course Syllabus: PHYS 1410
Revised Fall 2023

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

Instructor: Dr. Kimberly Bouldin
Office: S70 Levelland campus, B032 (Downtown Lubbock)
Office hours: MW 12:30-1pm (Levelland), 2-2:30 (Lubbock),
TTh 10-11am & 12:30-1pm (Levelland), F 9am-noon (Levelland)
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Course Room: S65
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, loose leaf paper or a spiral notebook that will fit inside the binder, 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:

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.

South Plains College is committed to maintaining a safe and healthy learning and work environment for students, faculty and staff as the SPC Texan Community returns to campus amid the COVID-19 pandemic. To accomplish this goal, it is imperative that everyone join together to do their part. SPC has developed a Return to Campus Plan that outlines how the college will operate and the measures that will be implemented to help protect you and your loved ones. We look forward to welcoming you back to campus, as we continue to emphasize the following points:

- All students, faculty and staff should monitor their health and notify appropriate personnel and their health care provider if they experience any symptoms related to COVID-19.
- All students, faculty and staff who have symptoms of COVID-19 should contact DeEtte Edens, BSN, RN in Health Services at dedens@southplainscollege.edu or at (806) 716-2376.
- Cleaning and sanitization process will be emphasized in every area of our campus.

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.

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.

For information regarding official South Plains College statements about intellectual exchange, disabilities, non-discrimination, Title IX Pregnancy Accommodations, CARE Team, and Campus Concealed Carry, please visit <https://www.southplainscollege.edu/syllabusstatements/>.

PHYS 1410 Elementary Physics Tentative Schedule Fall Semester 2023

<p>Week 1 Aug 28, Aug 30 Introduction, Ch 1 Lab 1—Fresnel lens and solar power demonstration, Size of the Sun (weather permitting) HW Ch 1</p>	<p>Week 9 Oct 23, 25 Ch 9 Lab 9—Gravity Flatland video HW Ch 9</p>
<p>Week 2 Sept 6 (Sept 4 Labor Day holiday) Ch 2 Lab 2—Size of the Solar System (outside if weather permits) HW Ch 2</p>	<p>Week 10 Oct 30, Nov 1 Ch 10 Lab 10—Projectile Motion HW Ch 10</p>
<p>Week 3 Sept 11, 13 Ch 3 Choose Midterm Project topic on Blackboard Lab 3—1D Air Rocket (Weather permitting) HW Ch 3</p>	<p>Week 11 Nov 6, 8 Ch 22 Lab 11--Electrostatics Review for Exam 2 HW Ch 22</p>
<p>Week 4 Sept 18, 20 Ch 4 Lab 4—Use the Force! Nova video—Mathematical Mysteries HW Ch 4</p>	<p>Week 12 Nov 13, 15 Ch 23 Lab 12—simplest motors HW Ch 23 Exam 2 over Ch 7-22 on Nov 15</p>
<p>Week 5 Sept 25, 27 Ch 5 Lab 5—Egg drop contest Quiz 1 over Ch 1-4 on Sept 27 HW Ch 5</p>	<p>Week 13 Nov 20 (Nov 22 holiday) Ch 24 Lab 13—Simple motor HW Ch 24 (last HW assignment)</p>
<p>Week 6 Oct 2, 4 Ch 6 Lab 6—Momentum HW Ch 6 Review for Exam 1</p>	<p>Week 14 Nov 27, 29 Midterm presentations Days 1 & 2</p>
<p>Week 7 Oct 9, 11 Ch 7 Lab 7—Conservation of Energy/Marble coaster Exam 1 over Ch 1-6 on Oct 11 HW Ch 7</p>	<p>Week 15 Dec 4, 6 Midterm presentations Day 3 Midterm Quiz on Dec 6 Selected topics and demos Bonus projects due by Dec 4.</p>
<p>Week 8 Oct 16, 18 Ch 8 Lab 8—Rotational Motion HW Ch 8</p>	<p>Final exam will be in class on Monday, Dec 11, 2023 from 10:15am-12:15pm.</p>