



K-12
TEXAS TECH

Physics I – Semester B v8.0 – Syllabus

Course Name

PHYSICS1-B

PHYSICS1 v8.0 – Semester B

Course Information

In this course, students will be immersed in the contributions of scientific geniuses that have changed the way we observe and think about matter, forces, and energy in the universe. Starting with how matter moves, students will learn that all motion can be described, analyzed, and predicted. Then students will explore the causes of changing motion, forces! Energy is a fundamental property essential to human existence, and physics will take students through all the forms of it: electricity, light, sound, heat, and more. Discover how waves travel and interact with matter and the smallest particles in the universe. From tiny atoms to galaxies with millions of stars, the universal laws of physics are explained through real-world examples. Through laboratory activities, simulations, and graphical analysis, combined with rigorous mathematical efforts and problem solving, students follow in the footsteps of some of the world's greatest thinkers and learn to process their world in a unique way.

Course Delivery Method

Online

Contacting Your Instructor

You may contact your instructor using your Canvas Inbox. Technical support is available 24/7 at [TTU K-12](#).

Course Topics

After completing this course, the students should have increased knowledge of

- Identify the components of an electrical circuit
- Measure and calculate electrical fields

- Explore the relationship between electrical current and magnetism
- Describe how capacitors are used in electrical circuits and electronics
- Represent electrical circuits using a schematic model
- Apply Ohm's law to explore the impact of resistance in a circuit
- Model and measure simple harmonic motion
- Identify the parts of a wave and use wave measurement calculations
- Explain the different behaviors of waves when they interact with boundaries
- Construct ray diagrams and use the lens and mirror equation to analyze image formation
- Describe properties of waves and their applications in real-world phenomena
- Differentiate between temperature and heat
- Calculate heat transfer between a surrounding and a system
- Explore thermal equilibrium and the conservation of thermal energy
- Discover the contributions of scientists that led to the development of a model of the atom
- Describe the dual nature of light and the photoelectric effect
- Compare types of radiation and describe applications of radioactivity
- Explore the special theory of relativity and scientific explanations about the origin of the universe

Textbook and Materials

No textbooks required. All content is within Canvas.

- [desmos Scientific Calculator - Texas Version](#)
- STAAR Physics Reference Materials

Materials

- | | | |
|------------------------------|-------------------------------|---------------------------------|
| • 200 pennies | • Graphing technology | • Round ball (e.g., tennis) |
| • Aluminum foil | • Hot water | • Scientific calculator |
| • A smooth and level surface | • Household materials | • Stopwatch |
| • Balloon | • Inclined plane/long ramp | • String |
| • Book | • Masking or cellophane tape | • Superball or other small ball |
| • Calculator | • Measuring cup | • Thermometer |
| • Centimeter ruler | • Meter stick | • Tissue paper |
| • Chalk | • Metric ruler or meter stick | • Two Styrofoam cups |
| • Cold water | • Pencil | • Washers or paper clips |
| • Droppable object | • Piece of paper | |
| • Felt fabric | | |
| • Graph paper | | |

Optional

- [Graphical Analysis Software](#)
 - Graphical Analysis was released before the Windows Vista operating system became available.
 - Students with a Windows Vista (or later) operating system will need the following tech tip to get the material to work:
 - Graphical Analysis contains a driver for LabPro that is incompatible with the Vista OS.
 - During installation of Graphical Analysis, there will be error messages during driver installation. Click through the messages, accepting the errors.
 - Next, the installer may attempt to install Quicktime. Quicktime is also incompatible with Vista. Decline the offer to install Quicktime. If your computer does not have Quicktime installed, visit quicktime.apple.com to install a Vista-compatible version.
 - At this point, you will have an installation of Graphical Analysis that will function normally.

Technical Requirements

- Internet access – preferably high speed (for accessing Canvas)
- browser (we recommend Chrome)
- supported browser plugins and settings
The following plugins and settings may be required to use our courses.
 - JavaScript enabled
 - Cookies enabled
 - Java installed
- Email
- Printing capabilities
- Adobe Reader (download from [Adobe](#))
- Audio and video capabilities (for watching/listening to course content)
- PDF app (free options available)

Technical Skill Requirements

Be comfortable with the following:

- accessing online learning materials via Canvas
- Internet search engines and browsers (we recommend Chrome)
- uploading assignments into Canvas (there will be instructions for uploading assignments)

Course Pacing

This course is designed to be completed in 18 weeks.

- Print this guide and use a calendar to fill in your goal dates for completing each Module.
- Note that you must have a grade of 70 or above on a Discussion-Based Assessment (DBA) in order to continue moving forward in the course. DBAs occur every other lesson.
- To achieve success, students are expected to submit work in each course weekly.
- Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week.
- Post the pace guide in a place where you and your Parent or Guardian will see it every day (on the refrigerator or next to the computer). Give yourself a check every time you complete a task, and celebrate your efforts!

****You will see that this lesson is labeled as "Honors," but you must complete it in order to meet Texas standards. It is not optional for this course.**

Weeks	Lessons	Due Date (you write this in)
1	Checkpoint 1 04.00 Circuits and Current Introduction 04.01 Electric Circuits and Forces 04.02 Electric Current and Magnetic Field 04.025 An Inquiry Exploration into Electrostatics	
2	04.03 Capacitance 04.04 Resistance and Schematics 04.05 Circuit Designs	
3	04.05B Engineering Design I 04.07 Circuits and Current Discussion-Based Assessment *04.08 Circuits and Current Exam	
4	05.00 Waves and Optics Introduction 05.01 Simple Harmonic Motion 05.015 Simple Harmonic Motion 05.02 Exploring Waves Discussion	

Weeks	Lessons	Due Date (you write this in)
5	05.03 Wave Behavior 05.04 Lenses and Mirrors	
6	05.05 Lens and Mirror Equation 05.06 Lens and Mirror Lab	
7	05.07 Snell's Law 05.08 Wave Phenomena 05.085 Application of Wave Polarization	
8	05.08B Telecommunications and Digital Information 05.08C Engineering Design II Checkpoint 2	
9	*05.10 Waves and Optics Exam 06.00 Heat and Particles Introduction	
10	06.01 Temperature 06.02 Thermal Energy	
11	06.04 Thermal Energy Lab	
12	06.05 Atomic Theory 06.06 Duality of Light	
13	06.06B Atomic Spectra 06.07 Photoelectric Effect 06.08B Fission and Fusion	
14	06.09 Relativity and Cosmology 06.09B Engineering Design III Checkpoint 3	
15	06.10 Heat and Particles Discussion-Based Assessment *06.11 Heat and Particles Exam	
16	*Final Exam	
17	Floating Vacation Week	
18	Floating Vacation Week	

Course Credit

Your grade will be calculated as follows:

- formative assessments (50%)
- summative assessments (20%)
- summative final exam (30%)

Assignments are labeled as “summative” or “formative” under Grades in Canvas.

Course Completion and Extensions

- Students may not complete the course in less than 30 days.
- All courses expire 180 days after the enrollment date.

Academic Integrity

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

“Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

Artificial Intelligence (AI) Use Policy

This policy covers any generative AI tool, such as ChatGTP, Elicit, Photo Math, etc. This includes text and artwork/graphics/video/audio, etc.

All work submitted in this course must be your own. You may not use artificial intelligence tools to complete your assignments in this course.

If an instructor suspects that an assignment is not the work of the student, it will receive a score of zero. The instructor will message the student or provide feedback on the assignment indicating the need to schedule a one-on-one video conference, during which the student will be required to demonstrate their skills or knowledge through an alternative or mutually agreed-upon assignment. The grade of the alternate or agreed upon assignment will be determined at the instructor’s discretion with the highest possible score being 70%.

If it is determined that a student has violated final exam directions on Final Exam A or CBE Set 1, the exam will be scored as zero. The student may take Final Exam B or CBE Set 2 with the highest possible score being 70%.

The incident will be reported to Texas Tech K-12 Administration and documented in the student’s file. Continued violations of Texas Tech University’s Academic Integrity Policy will result in the removal of the student from the program.

Student/Parent Expectations

You will be expected to log into the Canvas course regularly to be aware of possible announcements/reminders and to pace your student's progress in the course.

The following are prohibited while using the Canvas interface:

- spamming;
- hacking; and
- using TTU or Canvas email for commercial purposes;

Inappropriate behavior shall result in consequences ranging from a request to correct the problem, to removal from the course or even the university, depending on the severity of the behavior. Disciplinary actions will be taken according to the TTU K-12 Student Handbook.

Communication

- You can expect a reply from your instructor within 2 business days.
- Use the Canvas Inbox for sending messages to your instructor.

Submitting Assignments

You will submit all assignments through Canvas, rather than by mail or email.

Technical Difficulties

Getting Help

For student assistance with Canvas, visit [TTU K-12 Support](#).

Computer Problems

A working computer is necessary for online coursework. Computer problems will not be accepted as a valid reason for failure to complete course activities within the allotted time frame. Identify a second computer, before the course begins, that you can use if you experience computer problems.

Server Problems

When the Canvas server needs to be taken down for maintenance, the Canvas administrator will post an announcement in your course informing you of the time and date. If the server experiences unforeseen problems, your course instructor will notify you.

Lost or Corrupted Files

You must keep/save a copy of every project/assignment on an external disk or personal computer. In the event of any kind of technology failure (e.g., Canvas server crash or

virus infection, students' own computer problems, loss of files in cyberspace, etc.) or any disputes, the instructor may request or require you to resubmit the files. In some instances, the instructor may need to open another attempt within Canvas, so communication with your instructor is critical in these circumstances.