



2025-2026 Advanced Physics | Texas Scope & Sequence

Course Overview: This course is based on the AP Physics 1 course content which covers the basics of classical mechanics. It is also designed to cover all the Texas TEKS. The major difference in content is that Advanced Physics does not include Rotational Motion or Fluids but does include Waves, Sound, Light and Electricity and Quantum Physics instead. Students will confront complex situations or scenarios, to enable them to develop the ability to reason about relationships, applying and justifying the use of mathematical routines, designing experiments, analyzing data, and making connections across multiple topics within the course.

Standards:		AP Physics 1 CED		Physics TEKS						Academic Calendars				
Unit Number	Unit Title	Subunits (optional)	Number of Core Instructional Days	Number of Success/Flex Days	Number of Other Instructional Days (optional)	Number of Assessment Days	Recommended total number of class periods	Summative Assessment	Scanning Deadline <small>The last day student data will be incorporated for district-wide analysis.</small>	To be completed by teacher			Essential Questions (optional)	Enduring Understandings (optional)
										Unit Start Date	Unit End Date	Assessment Date <small>Advise dates by the scanning deadline. Exams with short constructed responses of less than 30 minutes to construct.</small>		
FALL SEMESTER														
1	1D Kinematics		15	1		1	17	TX_SCI_AdvancedP_hysics_F25_UE1	9/18/2025				What is the difference between scalar and vector measurements? How do we describe constant velocity motion? How do we describe constant acceleration motion? How can we determine displacement, velocity and acceleration from a Position-time graph? How can we determine displacement, velocity and acceleration from a Velocity-time graph?	Scalar measurements only require a number and vector measurements must have a number and a direction. Constant velocity motion travels the same distance during each unit of time (typically seconds). Constant acceleration motion has a velocity that changes by the same amount during each unit of time (typically seconds). On a Position-time graph displacement is read from the y-axis, velocity is the slope, and acceleration can be determined (qualitatively) from the direction of the curve of the graph. On a Velocity-Time graph displacement is the area under the curve, velocity can be read from the y-axis and acceleration is the slope to the graph.
2	2D Kinematics		12	2		1	15	TX_SCI_AdvancedP_hysics_F25_UE2	10/16/2025				How is a 2D vector represented as a combinations of 1D vectors? How can we predict the time of flight of a projectile?	2D vectors can be "broken down" into perpendicular 1D component vectors (vertical and horizontal). Time of flight for a projectile depends on the initial vertical velocity component and the initial height above the group. It can be determined using kinematics equations for constant acceleration motion.
3	Dynamics		21	2		2	25	TX_SCI_AdvancedP_hysics_F25_MUE3	11/16/2025				How are the forces acting on an object/system modeled? What is a net force? How can Newton's Second Law be used to predict the motion of objects/systems? When object A pushes or pulls on object B, which object "feels" the greater force?	Free body diagrams are used to model and analyze the forces acting on an object/system. All forces are drawn starting at the center of the object/system in the direction they act and proportional in length to the magnitude of the force. The net force acting on an object/system is the sum of all the forces acting on that object/system. Newton's Second Law states that the acceleration of an object/system is proportional to the net force acting on it. According to Newton's Third Law, ALL forces exist in pairs of force between interacting objects where the magnitude of the paired forces is the same and the directions are opposite.
					TX_SCI_AdvancedP_hysics_F25_UE3			11/20/2025						
4	Circular Motion		11	1		0	12	None	N/A				How is the direction of the instantaneous velocity of an object in circular motion described? How is the net force on an object in circular motion described? What forces create circular motion?	The instantaneous velocity of an object in circular motion is always directed perpendicular to the circular path. The net force acting on an object in circular motion is always directed towards the center of the circular path. Any force or combination of forces can create the net force known as centripetal force. Typical examples in AP Physics are Tension, Friction, Force of Gravity, or a combination of Normal and Force of Gravity.
Semester Exam Window: 12/8/25 - 12/19/25 Scanning Deadline: 12/19/25														
SPRING SEMESTER														
5	Energy		15	1		1	17	TX_SCI_AdvancedP_hysics_S26_UE5	2/12/2026				What are Kinetic and Potential Energies? What is Mechanical Energy? How does the definition of a system impact the Mechanical Energy? What is the Conservation of Mechanical Energy?	Kinetic Energy is the energy an object has due to its velocity. Potential energy is the energy a system has due to the relative position of objects. Mechanical Energy is the sum of all the Kinetic and Potential Energies of a system. A single object can only have kinetic energy and a system can have both kinetic and potential energy. The total Mechanical Energy of a system will remain constant when outside forces do not act on it (frictionless).
6	Momentum		12	1		1	14	TX_SCI_AdvancedP_hysics_S26_UE6	3/4/2026				What is momentum? How does the momentum of an object/system change? How do the momentum and kinetic energy of a system change during collisions?	The momentum of an object depends on velocity and mass only. The change in momentum of an object is equal to the impulse on the object (Force x time). The momentum of a system is always constant during a collision. The kinetic energy of the system usually decreases during a collision but for elastic collisions it remains constant.
7	Oscillations	5				1	6	TX_SCI_AdvancedP_hysics_S26_UE7	3/26/2026				How does a restoring force differ from a "regular" force? How does the presence of a restoring force create simple harmonic motion? When is a simple harmonic oscillator moving with the greatest velocity, acceleration, net force? How does the mechanical energy change throughout a simple harmonic oscillation?	The magnitude of a restoring force is proportional to the displacement of an object from an equilibrium position and in the opposite direction as the displacement. Meaning that an object subject to a restoring force is always being pushed towards its equilibrium location. The net force, acceleration, and potential energy of a system in SHM are all proportional to displacement. The velocity and KE of a system in SHM are inversely proportional to the displacement. The Mechanical Energy of a system in SHM remains constant, when frictionless.
8	Waves, Sound, and Light		18	1		1	20	TX_SCI_AdvancedP_hysics_S26_UE8	4/30/2026				What are mechanical waves? What are the different types of mechanical waves? What happens when waves collide? How are standing waves created? What determines the frequencies that create standing waves? What type of wave is light? How does a prism create a rainbow? Why does a mirror create an image that is inverted (left-right)? How does a magnifying glass create a larger image?	Mechanical waves are created by vibrations and are the movement of energy through a medium. Two types of mechanical waves: In Transverse waves the medium oscillates perpendicular to the wave velocity, and Longitudinal/Compression waves the wave medium oscillates parallel to the wave velocity. Waves can be in the same place at the same time and pass through each other. Because they are energy not matter, and when they are at the same location at the same time the displacement of the medium is the sum of the displacement of each wave. Standing waves are created when traveling waves are created in a medium where they reflect and interfere with each other. The fundamental frequency of standing wave (lowest frequency that produces a standing wave) depends on the length of the medium and the characteristics of the medium, tension for string or temperature for air. Standing waves occur in harmonic frequencies that are multiples of the fundamental frequency. Light is a non-mechanical, transverse wave, meaning it does not require a medium. Light waves are created by oscillations of element/molecules. The electromagnetic spectrum describes the range of frequencies/wavelengths and amount of energy of different types of light. Each type of light is a different frequency range on the spectrum. Light waves bend when crossing a boundary between two mediums in a process called refraction that allows prisms to create rainbows and lenses to create images larger/smaller than the actual object.
9	Electricity		6				6	N/A	N/A				How do objects become charged? How can we predict the magnitude of the force between charged particles? Describe the current through and voltage across elements in a series circuit. Describe the current through and voltage across elements in a parallel circuit. How do we measure the current through and voltage across elements in a circuit? Calculate the current through, voltage across, and power of elements in series or parallel circuits.	Objects become charged when charged particles (typically electrons) move from one object to another. The number of charges is conserved, so when one object gains electrons another object must lose the same number of electrons. Coulombs Law allows us to calculate the force created by two charged particles. This force is proportional to the charge of each object and inversely proportional to the distance between the particles. Each element in a circuit has a measurable amount of resistance to charge flowing through it. Series Circuits - the current through each element remains constant and the voltage across all the elements must sum to the same as the battery. Parallel circuits - the total voltage across each branch of the circuit remains the same and the sum of the currents must be the same as the current through the battery. Ohms Law - Voltage = Current x Resistance Power used by an element - Power = Current ² x Resistance
Final Exam Window: 5/11 - 5/22/26														