TTUISD - TEKS Tracker

Author _____Holly Rivera_____ Submission Date _____/_____/_____

Evaluator_____ Evaluation Date _____/_____/_____

TTUISD: Physics (PHYS 1A) Course v.3.0

TEKS: §112.39, High School, Beginning with School Year 2010-2011.

Text: *Conceptual Physics* . (2002) ISBN: 0-13-054254-7

TEKS Requirement (Secondary)		Sem. A	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
§112.39. Physics, Beginning with School Year 2010-2011 (One Credit).					
(a) General requirements. Students shall be awarded one credit for successful completion of this course. Algebra I is suggested as a prerequisite or co-requisite. This course is recommended for students in Grade 9, 10, 11, or 12.					
(b) Introduction.					
(1) Physics. In Physics, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students study a variety of topics that include: laws of motion; changes within physical systems and conservation of energy and momentum; forces; thermodynamics; characteristics and behavior of waves; and atomic, nuclear, and quantum physics. Students who successfully complete Physics will acquire factual knowledge within a conceptual framework, practice experimental design and interpretation, work collaboratively with colleagues, and develop critical thinking skills.					
(2) Nature of science. Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process." This vast body of changing and increasing knowledge is described by physical, mathematical, and conceptual models. Students should know that some questions are outside the realm of science because they deal with phenomena that are not scientifically testable.					
(3) Scientific inquiry. Scientific inquiry is the planned and deliberate investigation of the natural world. Scientific methods of investigation can be experimental, descriptive, or comparative. The method chosen should be appropriate to the question being asked.					
(4) Science and social ethics. Scientific decision making is a way of answering questions about the natural world. Students should be able to distinguish between scientific decision-making methods and ethical and social decisions that involve the application of scientific information.					
(5) Scientific systems. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.					
(c) Knowledge and skills.					
(1) Scientific processes. The student conducts investigations, for at least 40% of instructional time, using safe, environmentally appropriate, and ethical practices. These investigations must involve actively obtaining and analyzing data with physical equipment, but may also involve experimentation in a simulated environment as well as field observations that extend beyond the classroom. The student is expected to:					
(A) demonstrate safe practices during laboratory and field investigations; and	**A**		labs		Remember
(B) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.	**A**		labs		Remember
(2) Scientific processes. The student uses a systematic approach to answer scientific laboratory and field investigative questions. The student is expected to:					
(A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section;	**A**		Unit 1		Understand
(B) know that scientific hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power which have been tested over a wide variety of conditions are incorporated into theories;	**A**		Unit 1		Understand
(C) know that scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but may be subject to change as new areas of science and new technologies are developed;	**A**		Unit 1		Understand
(D) distinguish between scientific hypotheses and scientific theories;	**A**		Unit 1		Understand
(E) design and implement investigative procedures, including making observations, asking well-defined questions, formulating testable hypotheses, identifying variables, selecting appropriate equipment and technology, and evaluating numerical answers for reasonableness;	**A**		LabPaq labs		Evaluate

TEKS Requirement (Secondary)		Sem. A	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
(F) demonstrate the use of course apparatus, equipment, techniques, and procedures, including multimeters (current, voltage, resistance), triple beam balances, batteries, clamps, dynamics demonstration equipment, collision apparatus, data acquisition probes, discharge tubes with power supply (H, He, Ne, Ar), hand-held visual spectroscopes, hot plates, slotted and hooked lab masses, bar magnets, horseshoe magnets, plane mirrors, convex lenses, pendulum support, power supply, ring clamps, ring stands, stopwatches, trajectory apparatus, tuning forks, carbon paper, graph paper, magnetic compasses, polarized film, prisms, protractors, resistors, friction blocks, mini lamps (bulbs) and sockets, electrostatics kits, 90-degree rod clamps, metric rulers, spring scales, knife blade switches, Celsius thermometers, meter sticks, scientific calculators, graphing technology, computers, cathode ray tubes with horseshoe magnets, ballistic carts or equivalent, resonance tubes, spools of nylon thread or string, containers of iron filings, rolls of white craft paper, copper wire, Periodic Table, electromagnetic spectrum charts, slinky springs, wave motion ropes, and laser pointers;	**A**		LabPaq labs		Apply
(G) use a wide variety of additional course apparatus, equipment, techniques, materials, and procedures as appropriate such as ripple tank with wave generator, wave motion rope, micrometer, caliper, radiation monitor, computer, ballistic pendulum, electroscope, inclined plane, optics bench, optics kit, pulley with table clamp, resonance tube, ring stand screen, four inch ring, stroboscope, graduated cylinders, and ticker timer;	**A**		LabPaq labs		Apply
(H) make measurements with accuracy and precision and record data using scientific notation and International System (SI) units;	**A**		LabPaq labs		Apply
(I) identify and quantify causes and effects of uncertainties in measured data;	**A**		Chapter 1; Significant figures, Error and uncertainty lab		Analyze
(J) organize and evaluate data and make inferences from data, including the use of tables, charts, and graphs;	**A**		Semesters A & B, throughout course, LabPaq labs		Evaluate
(K) communicate valid conclusions supported by the data through various methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports; and	**A**		LabPaq labs		Apply
(L) express and manipulate relationships among physical variables quantitatively, including the use of graphs, charts, and equations.	**A**		LabPaq labs		Apply
(3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:					
(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;	**A**		Making Informed Decisions assignment		Evaluate
(B) communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials;	**A**		Chapter 1; Making Informed Decisions assignment		Apply
(C) draw inferences based on data related to promotional materials for products and services;	**A**		Chapter 1, Making Informed Decisions assignment		Analyze
(D) explain the impacts of the scientific contributions of a variety of historical and contemporary scientists on scientific thought and society;	**A**		throughout reading		Understand
(E) research and describe the connections between physics and future careers; and	**A**				Understand
(F) express and interpret relationships symbolically in accordance with accepted theories to make predictions and solve problems mathematically, including problems requiring proportional reasoning and graphical vector addition.	**A**		LabPaq labs		Apply
(4) Science concepts. The student knows and applies the laws governing motion in a variety of situations. The student is expected to:					
(A) generate and interpret graphs and charts describing different types of motion, including the use of real-time technology such as motion detectors or photogates;	**A**		Unit 2; Graph that Motion; Graphing Motion simulations		Apply
(B) describe and analyze motion in one dimension using equations with the concepts of distance, displacement, speed, average velocity, instantaneous velocity, and acceleration;	**A**		Unit 2		Apply

TEKS Requirement (Secondary)		Sem. A	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
(C) analyze and describe accelerated motion in two dimensions using equations, including projectile and circular examples;	A		Chapters 2, 3, 9		Apply
(D) calculate the effect of forces on objects, including the law of inertia, the relationship between force and acceleration, and the nature of force pairs between objects;	A		Chapters 4, 5, 6		Apply
(E) develop and interpret free-body force diagrams; and	A		Chapters 4, 5, 6		Apply
(F) identify and describe motion relative to different frames of reference.	A		Chapter 2		Understand
(5) Science concepts. The student knows the nature of forces in the physical world. The student is expected to:					
(A) research and describe the historical development of the concepts of gravitational, electromagnetic, weak nuclear, and strong nuclear forces;	A				Remember
(B) describe and calculate how the magnitude of the gravitational force between two objects depends on their masses and the distance between their centers;	A		Chapter 12		Understand
(C) describe and calculate how the magnitude of the electrical force between two objects depends on their charges and the distance between them;	A				Understand
(D) identify examples of electric and magnetic forces in everyday life;	A				Understand
(E) characterize materials as conductors or insulators based on their electrical properties;	A				Understand
(F) design, construct, and calculate in terms of current through, potential difference across, resistance of, and power used by electric circuit elements connected in both series and parallel combinations;	A				Create
(G) investigate and describe the relationship between electric and magnetic fields in applications such as generators, motors, and transformers; and	A				Understand
(H) describe evidence for and effects of the strong and weak nuclear forces in nature.	A		Chapters 39 and 40; Four Fundamental Forces Assignment		Understand
(6) Science concepts. The student knows that changes occur within a physical system and applies the laws of conservation of energy and momentum. The student is expected to:					
(A) investigate and calculate quantities using the work-energy theorem in various situations;	A		Chapter 8		Apply
(B) investigate examples of kinetic and potential energy and their transformations;	A		Chapter 8		Understand
(C) calculate the mechanical energy of, power generated within, impulse applied to, and momentum of a physical system;	A		Chapter 8		Apply
(D) demonstrate and apply the laws of conservation of energy and conservation of momentum in one dimension;	A		Chapters 7 and 8; LabPaq labs		Apply
(E) describe how the macroscopic properties of a thermodynamic system such as temperature, specific heat, and pressure are related to the molecular level of matter, including kinetic or potential energy of atoms;	A				Apply
(F) contrast and give examples of different processes of thermal energy transfer, including conduction, convection, and radiation; and	A				Apply
(G) analyze and explain everyday examples that illustrate the laws of thermodynamics, including the law of conservation of energy and the law of entropy.	A				Analyze
(7) Science concepts. The student knows the characteristics and behavior of waves. The student is expected to:					
(A) examine and describe oscillatory motion and wave propagation in various types of media;	A				Understand
(B) investigate and analyze characteristics of waves, including velocity, frequency, amplitude, and wavelength, and calculate using the relationship between wavespeed, frequency, and wavelength;	A				Apply
(C) compare characteristics and behaviors of transverse waves, including electromagnetic waves and the electromagnetic spectrum, and characteristics and behaviors of longitudinal waves, including sound waves;	A				Understand
(D) investigate behaviors of waves, including reflection, refraction, diffraction, interference, resonance, and the Doppler effect;	A				Understand
(E) describe and predict image formation as a consequence of reflection from a plane mirror and refraction through a thin convex lens; and	A				Apply
(F) describe the role of wave characteristics and behaviors in medical and industrial applications.	A				Apply
(8) Science concepts. The student knows simple examples of atomic, nuclear, and quantum phenomena. The student is expected to:					
(A) describe the photoelectric effect and the dual nature of light;	A				Understand
(B) compare and explain the emission spectra produced by various atoms;	A				Understand
(C) describe the significance of mass-energy equivalence and apply it in explanations of phenomena such as nuclear stability, fission, and fusion; and	A				Apply
(D) give examples of applications of atomic and nuclear phenomena such as radiation therapy, diagnostic imaging, and nuclear power and examples of applications of quantum phenomena such as digital cameras.	A				Apply

TEKS Requirement (Secondary)		Sem. A	Lesson & Assignment Number	Textbook Chapter/Page #	Bloom's Taxonomy
Source: The provisions of this §112.39 adopted to be effective August 4, 2009, 34 TexReg 5063.					