Grade 10-12
Distance Learning Module 3: Week of: April 13th – April 17th

Content Area: Physics Level 2

Course Title - *Modified from Unit #5 & Unit #4 - Work, Energy, & Power, & Circular Motion*

Targeted Goals from Stage 1: Desired Results

Students will understand what energy is, the different types of energy, how and when energy is conserved. At the end of the week, students will begin the next unit

Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.

Content Knowledge: Students will demonstrate Knowledge of the following:

- in order to change the energy of an object, work must be done on the object.
- kinetic and potential together are the mechanical energy of an object
- potential energy is stored energy and can be chemical, nuclear, elastic or gravitational
- non conservative forces can remove mechanical energy from an object and convert it to heat
- work can be positive or negative ; it can add or remove mechanical energy of an object
- the total energy of an object is conserved if only conservative forces act on the object

Students will demonstrate Knowledge of the following for unit #4:

- Objects moving in a circular path have a net force directed inward
- Friction, gravity, normal force, tension can all be "centripetally directed" forces
- the centripetal acceleration is dependent on the radius of the circle and the velocity of the object

Vocabulary:

Momentum, impulse, work, displacement, direction of motion

Centripetal, Centrifugal, radius, Force, gravity, gravitational

Skills: Students will demonstrate the following skills:

- calculate gravitational potential energy, elastic potential energy and kinetic energy of an object
- use the conservation of energy to solve problems
- use the work energy theory to analyze objects that have friction acting on them
- apply kinematics and force principles to predict the motion of objects involving transfer of energy

Students will demonstrate the following skills for Unit #4

- calculate the centripetal acceleration of an object
- find the maximum speed an object can swing in a circle without the string breaking
- draw free body diagrams of circularly moving objects and identify the net force directed inward

Expectation: Complete the notes, work the UTexas problems, and the basic practice problems (no check in on that one), notes check in

Description of Task (s):	**Resources and Materials:**	**Daily Checks (Return to Google Classroom or snapshots from a cell phone)**
Monday: Students will work on energy notes which are posted on the google classroom. They can read through this independently, while perhaps following the textbook, but are also welcome to follow along with the videos/zoom classroom experience.	Notes that are posted on the Google Classroom Textbook, online copy posted on the Google Classroom Videos posted that are going over the notes Use of the Zoom classroom *Crash Course Physics Videos:* *Work, energy, and power video*	*Participation in Zoom classroom learning as available and needed*

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom or snapshots from a cell phone)
	Flipping Physics Videos: *Work, energy, and power page directory* *Khan Academy Physics Videos:* *Work and Energy unit* *The Physics Classroom tutorials* *Work, energy, and power page directory*	
Tuesday: Students are to complete the UTexas which has a focus on energy and conservation of energy problems. IF students struggle with UTexas and need extra time, they are to let teachers know ASAP	Notes that are posted on the Google Classroom Textbook, online copy posted on the Google Classroom Videos posted that are going over the notes Use of the Zoom classroom *Crash Course Physics Videos:* *Work, energy, and power video* *Flipping Physics Videos:* *Work, energy, and power page directory* *Khan Academy Physics Videos:* *Work and Energy unit* *The Physics Classroom tutorials*	Completing UTexas with a score of 75% or higher *Participation in Zoom classroom learning as available and needed*

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom or snapshots from a cell phone)
	Work, energy, and power page directory	
Wednesday: Students will begin their notes on Circular motion, particularly Gravitational Force and Centripetal Force. They can supplement Zoom class meetings with the videos/resources to the right, and also the video lecture that is posted on the classroom, working through the problems.	Notes that are posted on the Google Classroom Textbook, online copy posted on the Google Classroom Videos posted that are going over the notes Use of the Zoom classroom *Crash Course Physics Videos:* *Uniform Circular Motion* *Newtonian Gravity* *Flipping Physics Videos:* *Universal Gravitation List* *Khan Academy Physics Videos:* *Centripetal & Gravitational Unit* *The Physics Classroom tutorials* *Circular Motion & Gravitational Motion Directory Page*	*Participation in Zoom classroom learning as available and needed*
Thursday: Students are to continue working through the notes, and to begin working on the associated UTexas which will focus on the beginning portion of the notes	Notes that are posted on the Google Classroom Textbook, online copy posted on the Google Classroom Videos posted that are going over the notes	*Participation in Zoom classroom learning as available and needed*

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom or snapshots from a cell phone)
	Use of the Zoom classroom *Crash Course Physics Videos:* *Uniform Circular Motion* *Newtonian Gravity* *Flipping Physics Videos:* *Universal Gravitation List* *Khan Academy Physics Videos:* *Centripetal & Gravitational Unit* *The Physics Classroom tutorials* *Circular Motion & Gravitational Motion Directory Page*	
Friday: Students are to complete the 2nd UTexas assignment of the week	Notes that are posted on the Google Classroom Textbook, online copy posted on the Google Classroom Videos posted that are going over the notes Use of the Zoom classroom *Crash Course Physics Videos:* *Uniform Circular Motion*	Completing UTexas with a score of 75% or higher *Participation in Zoom classroom learning as available and needed*

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom or snapshots from a cell phone)
	Newtonian Gravity *Flipping Physics Videos:* *Universal Gravitation List* *Khan Academy Physics Videos:* *Centripetal & Gravitational Unit* *The Physics Classroom tutorials* *Circular Motion & Gravitational Motion Directory Page*	

Week criteria for success (attach student checklists or rubrics): *Greater than 75 % on Assigned UTexas Assessments*

Supportive resources and tutorials for the week (plans for re-teaching): *Textbook; Finalsite resources (Powerpoints, worksheets with answer keys, pdf notes); Khan Academy; Crash Physics videos; PHeT simulators from University of Colorado; Flipping Physics videos; Interactions with teacher using Zoom.*