CORE CURRICULUM COMPONENT APPLICATION
Texarkana College

Part I: Course Information

Course Type
☒ Existing/Restructured
☐ New Course

Course Prefix & Number: **PHYS 2325**

Texas Common Course Number (TCCN): **2325**

Course Title: **University Physics I**

Course Catalog Description

University Physics I (4,3,3). Designed primarily for students of engineering, physics, the physical sciences, or anyone needing a more mathematically rigorous physics course. Topics will include vector algebra, mechanics, thermodynamics, sound and wave motion.

Course Prerequisites:

Available Online?
☐ Yes
☒ No

Part II: THECB Course Objectives
Upon successful completion of this course, students will:
1. Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.
2. Solve problems involving forces and work.
3. Apply Newton's laws to physical problems.
4. Identify the different types of energy.
5. Solve problems using principles of conservation of energy.
6. Define the principles of impulse, momentum, and collisions.
7. Use principles of impulse and momentum to solve problems.
8. Determine the location of the center of mass and center of rotation for rigid bodies in motion.
9. Discuss rotational kinematics and dynamics and the relationship between linear and rotational motion.
10. Solve problems involving rotational and linear motion.
11. Define equilibrium, including the different types of equilibrium.
12. Discuss simple harmonic motion and its application to real-world problems.
13. Solve problems involving the First and Second Laws of Thermodynamics.
14. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.

15. Conduct basic laboratory experiments involving classical mechanics.
16. Relate physical observations and measurements involving classical mechanics to theoretical principles.
17. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
18. Design fundamental experiments involving principles of classical mechanics.
19. Identify appropriate sources of information for conducting laboratory experiments involving classical mechanics.

Part III: THECB Skill Objectives

1. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

2. Communication Skills: to include effective development, interpretation and expression of ideas through written, oral and visual communication

3. Empirical and Quantitative Skills: to include applications of scientific and mathematical concepts.

4. Teamwork: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

Part IV: Course Student Learning Outcomes (SLO)

1. Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.
2. Solve problems involving forces and work.
3. Apply Newton's laws to physical problems.
4. Identify the different types of energy.
5. Solve problems using principles of conservation of energy.
6. Define the principles of impulse, momentum, and collisions.
7. Use principles of impulse and momentum to solve problems.
8. Determine the location of the center of mass and center of rotation for rigid bodies in motion.
9. Discuss rotational kinematics and dynamics and the relationship between linear and rotational motion.
10. Solve problems involving rotational and linear motion.
11. Define equilibrium, including the different types of equilibrium.
12. Discuss simple harmonic motion and its application to real-world problems.
13. Solve problems involving the First and Second Laws of Thermodynamics.
14. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.
15. Conduct basic laboratory experiments involving classical mechanics.
16. Relate physical observations and measurements involving classical mechanics to theoretical principles.

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17. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements. 18. Design fundamental experiments involving principles of classical mechanics. 19. Identify appropriate sources of information for conducting laboratory experiments involving classical mechanics.

Skill Objective:	**Critical Thinking Skills:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
THECB Course Objective	Discuss simple harmonic motion and its application to real-world problems.
Course Student Learning Outcome	Discuss simple harmonic motion and its application to real-world problems.
General Learning Activities	We will do an experiment on Simple Harmonic Motion (SHM). The experiment will be performed with a pendulum and spring. After a discussion of basic SHM, students will be asked to determine which variables might affect SHM. Then the experiment will be performed to determine which variables actually affect SHM. Student will then need to determine why each variable did or did not affect SHM.
Assessment ***Must Include Assignment & Rubric***	The assignment will be to create and carry out the experiment on simple harmonic motion. The Critical Thinking Skills rubric will be used

Skill Objective:	**Communication Skills:** to include effective written, oral, and visual communication
THECB Course Objective	Discuss simple harmonic motion and its application to real-world problems.
Course Student Learning Outcome	Discuss simple harmonic motion and its application to real-world problems.
General Learning Activities	Students in a group will give the explanations of the experiment in written form. They will also be responsible for preparing a PowerPoint presentation and giving it as a group to the whole class.
Assessment ***Must Include Assignment & Rubric***	The assignment will be to communicate in a written report and in a class presentation the results of the experiment on simple harmonic motion. The Communication Skills rubric will be used.

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Skill Objective:	**Empirical and Quantitative Skills:** to include applications of scientific and mathematical concepts.
THECB Course Objective	Discuss simple harmonic motion and its application to real-world problems.
Course Student Learning Outcome	Discuss simple harmonic motion and its application to real-world problems.
General Learning Activities	Students must understand and be able to apply the principles of SHM. The experiment requires that mathematic representations of SHM be used in the explanation of the principle.
Assessment ***Must Include Assignment & Rubric***	The assignment will be to apply scientific and mathematical principles to the analysis of the data collected in the experiment and come to a conclusion. The Empirical and Quantitative Skills rubric will be used.

Skill Objective:	**Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal
THECB Course Objective	Discuss simple harmonic motion and its application to real-world problems.
Course Student Learning Outcome	Discuss simple harmonic motion and its application to real-world problems.
General Learning Activities	Students will work together to formulate a hypothesis about SHM, perform the experiment, formulate explanations, and give a presentation to the class on their results.
Assessment ***Must Include Assignment & Rubric***	The assignment will be to collect and carry out the experiment as a group and to meet as a group to analyze the data and make a report and presentation. We will use the Teamwork rubric.