Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

PHYSICS 1

Grade 11

Course Description:

This course introduces learners to the fundamental principles governing the physical world, focusing on matter, motion, and energy interactions. It covers core topics in physics, including measurement, kinematics, dynamics, energy, momentum, rotational mechanics, and periodic motion. Through hands-on experiments, real-world problem solving, and critical analysis, students will develop scientific inquiry, mathematical reasoning, and an appreciation for the role of physics in technology, society, and STEM-related careers.

Elective: Academic
Prerequisite: None
Time Allotment: 80 hours for one semester, 4 hours per week
Schedule: First Semester

Quarter 1: Measurements and Translational Kinematics

Content	**Content Standards** *The learners learn that*	**Learning Competencies** *The learners*
1. Introduction to Physics	1. Physics is fundamental to understanding the natural world in a scientific way and leads to the development of many applications that benefit society;	1. use secondary sources to evaluate the impact of physics in society and identify the range of careers that are available through the study of physics;
2. Kinematics	2. measuring should be done precisely and accurately, and must be expressed correctly; and	2. conduct simple experiments on the translational motion of objects in one- and two-dimensions using standard and alternative measuring tools to measure length and time quantitatively; 3. define the fundamental quantities and the basis of its SI units;
	3. qualitative, quantitative, and graphical analysis of motion provide complementary ways to understand, describe, and predict motion.	4. calculate displacement, velocity, and acceleration in one-dimensional motion; 5. create and interpret motion graphs of one-dimensional motion (displacement-time, velocity-time, and acceleration-time graphs); 6. derive the four kinematic equations and their various forms through algebraic methods to solve

		various cases of uniformly accelerated motion (horizontal and vertical); 7. carry out first-hand investigations involving 2-dimensional projectile and circular motion to investigate factors, such as speed, radius, and centripetal force; 8. explain concepts of moving reference frames and relative motion; and 9. solve physics problems involving uniformly accelerated motion (horizontal and vertical), projectile, circular, and relative motion in one- and two-dimensions in various contexts, such as moving vehicles, riverboat problems, aircraft, and spacecraft navigation.
Performance Standards *By the end of the quarter, learners* properly measure and use pertinent units, compute resultant vectors, and analyze motion graphs. They explain, calculate, and analyze one-dimensional, two-dimensional, and relative motion in practical contexts and solve problems using kinematic equations. They also describe and explain how basic physics principles are applied to describe and make predictions about motion in everyday situations and scenarios.		
Suggested Performance Task ● Prove through experimentation, data gathering, graphical representation, and analysis that vertical and horizontal motion are independent of each other in projectile motion.		

Quarter 2: Dynamics

Content	**Content Standards** *The learners learn that*	**Learning Competencies** *The learners:*
Translational dynamics *1. Types of forces* *2. Newton's Laws of Motion and their applications* *3. Work and power* *4. Energy* *5. Momentum*	1. Newton's Laws of Motion, work, energy, power, and the conservation of energy are essential for understanding the behavior of objects and systems; 2. momentum, impulse, and the laws of conservation are essential in evaluating the efficiency and safety of physical systems;	1. conduct simple experiments on forces using standard and alternative measuring tools to measure length, mass, volume, and time quantitatively; 2. determine the resultant of one- to two-dimensional vectors using analytical methods; 3. apply Newton's laws of motion in solving word problems involving equilibrium and non-equilibrium cases; 4. calculate work done by an applied force and the power generated in practical situations such as engineering and sports science; 5. explain how energy is conserved in various real-life scenarios; 6. develop a table to summarize how the principles of impulse and conservation of linear momentum apply in various real-life contexts, such as sports performance, vehicle safety systems, industrial processes, and space exploration;
Rotational mechanics *1. Rotational motion* *2. Force and torque* *3. Mass and moment of inertia*	3. rotational mechanics can maximize efficiency in physical systems; and	7. describe rotational motion in terms of angular displacement, angular velocity, angular acceleration, and angular frequency; 8. explain various phenomena involving rotational motion using the concepts of torque, moment of inertia, and angular momentum; 9. design a prototype applying concepts of rotational motion to improve processes involved in various fields such as the automotive industry, amusement park rides, and manufacturing;

Periodic motion 1. *Oscillations* 2. *Simple harmonic motion*	4. simple harmonic motion can be characterized by periodic motion.	10. draw on personal experiences and secondary sources to demonstrate through simple activities the concept of simple harmonic motion in natural and human-made situations; 11. describe simple harmonic motion in terms of amplitude, period, frequency, phase, and how its principles are applied in the design of everyday systems; and 12. use mathematical models to solve for and describe the displacement, velocity, and acceleration of objects in simple harmonic motion.

Performance Standards

By the end of the quarter, learners properly measure and use pertinent units, compute resultant vectors, and analyze motion graphs. They explain, calculate, and analyze one-dimensional, two-dimensional, and relative motion in practical contexts and solve problems using kinematic equations. They also describe and explain how basic physics principles are applied to describe and make predictions about motion in everyday situations and scenarios.

Suggested Performance Task

- Design and run a Rube Goldberg Machine to demonstrate the concepts of the laws of conservation of energy, Newton's laws of motion, and rotational motion. Write a quantitative and qualitative analysis of the system.