



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM
PHYSICS 2
Grade 11

Course Description:

This course deepens learners' understanding of the physical principles governing gravitational, thermal, and fluid systems. It explores the law of universal gravitation, the behavior of fluids at rest and in motion, the nature of heat and temperature, and the fundamental laws of thermodynamics. Emphasizing both conceptual understanding and quantitative analysis, the course develops learners' skills in scientific investigation, critical thinking, and problem-solving, while highlighting the relevance of physics in everyday life, technological innovation, and various STEM-related fields.

Elective: Academic

Prerequisite: Physics 1

Time Allotment: 80 hours for one semester, 4 hours per week

Schedule: Second Semester

Quarter 3: Periodic Motion and Fluid Mechanics

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
Gravity 1. <i>Newton's Law of Motion</i> 2. <i>Universal Gravitational</i> 3. <i>Gravitational potential energy</i>	1. Newton's law of universal gravitation can help explain the celestial motion of natural and artificial satellites.	1. use Newton's universal gravitation equation to determine the force of gravity between two objects, including between nearby objects, and between planets and satellites; 2. calculate gravitational potential energy in various contexts, such as near-Earth objects, satellites, and planets;
Fluid mechanics 1. <i>Properties of fluids</i> 2. <i>Fluid statics</i> 3. <i>Fluid dynamics</i>	2. the properties of fluids are fundamental for understanding fluid behavior and its applications in various systems; and	3. identify everyday situations that involve fluids in natural situations, and which make use of fluids in practical applications; 4. describe the properties of fluids, including density, viscosity, pressure, surface tension, and compressibility; 5. explain how the output force in a hydraulic system is influenced by the difference in cross-sectional areas of the connected components;

	<p>3. buoyancy has a crucial role in maintaining balance and stability in fluids to ensure safety of aquatic and aerial structures and vehicles.</p>	<p>6. explain how Archimedes' principle affects the buoyant force exerted on objects submerged in fluids;</p> <p>7. investigate the factors affecting fluid pressure and type of flow in various systems such as piping systems, hydraulic systems, blood circulation, and aerospace;</p> <p>8. explain Bernoulli's Principle and its applications in real-world scenarios, such as aviation, and safety; and</p> <p>9. solve problems involving Archimedes' principle, Pascal's principle, the continuity equation, and Bernoulli's principle.</p>
<p>Performance Standards <i>By the end of the quarter, learners describe and explain the physical principles governing gravitational systems and the properties of fluids. They analyze and apply the principles of fluid dynamics to resolve problems in systems and applications. They design and conduct experiments to demonstrate fluid properties and apply fluid mechanics principles to develop practical solutions to real-world problems, showcasing the relevance and impact of fluid behavior in various fields.</i></p>		

Quarter 4: Heat and Thermodynamics

Content	Content Standards <i>The learners learn that</i>	Learning Competencies <i>The learners</i>
<p>Heat in Systems</p> <ol style="list-style-type: none"> 1. <i>Mechanisms of heat transfer</i> 2. <i>Temperature and heat</i> 3. <i>Phase change</i> 4. <i>Thermal expansions</i> 	<ol style="list-style-type: none"> 1. concepts of temperature and heat are vital to explain processes in different natural and artificial systems; 2. the concepts of thermal expansion are critical in constructing and designing buildings, bridges, and train rails; 	<ol style="list-style-type: none"> 1. recall the methods of heat transfer and their applications, such as in cooking, building insulation, and thermal clothing; 2. explain how temperature is measured in various contexts, such as body temperature, air temperature, and apparent temperature (heat index); 3. use a table to explain how the nature of heat facilitates the movement of energy in environmental systems, body systems, chemical systems, and technological systems; 4. calculate the amount of heat needed for temperature change and phase change of various substances; 5. quantitatively investigate the factors affecting compression and expansion of solids due to a change in temperature;
<p>Thermodynamic processes and Laws of Thermodynamics</p> <ol style="list-style-type: none"> 1. <i>Zeroth Law of Thermodynamics.</i> 2. <i>First Law of Thermodynamics</i> 3. <i>Second Law of Thermodynamics</i> 	<ol style="list-style-type: none"> 3. quantifying heat transfers in a thermal system is vital in understanding its energy efficiency; and 4. the laws of thermodynamics have a wide range of applications across various fields. 	<ol style="list-style-type: none"> 6. use information from secondary sources to describe thermodynamic processes in engines and refrigeration systems; 7. describe and explain the factors affecting the efficiency of engines, such as working cycle, friction, and material limitations; and 8. use the laws of thermodynamics to describe how different sustainable energy technologies work.

Performance Standards	
<p><i>By the end of the quarter, learners distinguish the fundamental concepts of temperature and heat and explain the methods of heat transfer using examples. Learners design and conduct simple experiments to demonstrate thermodynamic processes, showcasing the relevance and impact of thermodynamics in various practical applications. They analyze and apply the laws of thermodynamics to solve word problems and explain their real-world applications. They describe and analyze thermodynamic processes in various systems and calculate the efficiency of heat engines and refrigeration systems. They discuss the principles of phase transitions in terms of latent heat and phase and describe the role of thermodynamics in environmental and engineering systems.</i></p>	
Suggested Performance Task	
<ul style="list-style-type: none">• Plan and execute an interactive educational exhibit that simulates heat transfer in a thermodynamic system.	