StudyForge
DIGITAL CURRICULUM

Physics 11

Type: Online

Course Description:

Physics 11 is the first opportunity students have to dive deeply into our intricate and intriguing world of energy and forces! These two culprits are responsible for everything from roller coasters, parachuting, car crashes, listening to acoustic bliss from your favourite band, to enjoying steaming hot cups of coffee, warming your hands by a fire, and playing on your favourite battery-powered devices, to name only a few of the phenomena we experience in our lives every day. Well, hopefully not the crashes.

Technically, these events fall under the more scientific concepts of kinematics, dynamics, momentum, electricity, circuits and waves, etc. But more importantly, in this course, students will find themselves absorbed and inspired - through animated instructional videos and other engaging materials - by a feast of real-life applications and discoveries of these very same concepts. This course is designed to propel students on an exciting journey toward a solid and firm understanding of the fascinating physical world that exists all around them.

Major Units and Topics:

- Math Foundations
- Kinematics
- Forces
- Newton's Laws
- Energy
- Electricity
- Circuits
- Waves

Assessments:

- Video Notes
- Quizzes and Tests
- Practice Questions
- Review Assignments
- Projects
- Labs
- Practice Tests

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Student Requirements:

- Scientific Calculator

Learning Standards Overview:

Content *Students are expected to know the following:*	**Ch 1**	**Ch 2**	**Ch 3**	**Ch 4**	**Ch 5**	**Ch 6**	**Ch 7**	**Ch 8**
Vector and Scalar Quantities								
Addition and subtraction	✔	✔	✔	✔	✔			✔
Right-angle triangle trigonometry	✔	✔	✔	✔				✔
Uniform and Accelerated motion								
Graphical and quantitative analysis		✔	✔	✔				✔
Projectile Motion: 1 D and 2 D, including:								
Vertical launch		✔	✔	✔				
Horizontal launch		✔	✔	✔				
Angled launch		✔	✔	✔				
Contact Forces								
For example, normal force, spring force, tension force, frictional force			✔	✔				
Newton's Laws of Motion								

First: the concept of mass as a measure of inertia				✔				
Second: net force from one or more forces				✔				
Third: actions/reactions happen at the same time in pairs				✔				
Forces in Systems								
One-body and multi-body systems			✔	✔				
Inclined planes			✔	✔	✔			
Angled forces			✔	✔				
Elevators			✔	✔				
Power and Efficiency								
Mechanical and electrical (e.g., light bulbs, simple machines, motors, steam engines, kettle)					✔		✔	
Numerical examples (e.g., resistance, power, and efficiency in circuits)					✔		✔	
Simple Machines								
Lever, ramp, wedge, pulley, screw, wheel and axle			✔	✔	✔			
Electric Circuits (DC), Ohm's law, and Kirchhoff's laws								
Including terminal voltage versus electromotive force (EMF) (e.g., safety, power distribution, fuses/breakers, switches, overload, short circuits, alternators)						✔	✔	
Thermal Equilibrium								

As an application of law of conservation of energy (e.g., calorimeter)					✔			
Propagation of Waves								
Transverse versus longitudinal								✔
Linear versus circular								✔
Properties and Behaviours								
Properties: differences between the properties of a wave and the properties of the medium, periodic versus pulse								✔
Behaviours: reflection (open and fixed end), refraction, transmission, diffraction, interference, Doppler shift, standing waves, interference patterns, law of superposition								✔
Characteristics								
For example, pitch, volume, speed, Doppler effect, sonic boom								✔
Frequency								
For example, harmonic, fundamental/natural, beat frequency								✔
Graphical Methods								
Plotting of linear relationships given a physical model (e.g., uniform motion, resistance)	✔	✔	✔	✔	✔	✔	✔	✔
Calculation of the slope of a line of best fit, including significant figures and appropriate units	✔			✔		✔	✔	✔

Interpolation and extrapolation data from a constructed graph (e.g., position, instantaneous velocity)	✔					✔		
Calculations and interpretations of area under the curve on a constructed graph (e.g., displacement, work)	✔	✔						