PHYSICS SYLLABUS SEQUENCE 2020/21			
GRADE:	**12**		
TERM:	**1**		
WEEK:	**DATE**	**TOPICS**	**OBJECTIVES**
1	**Sept. 12 to 16**	**Mathematical Requirements Physical Quantities & SI Units**	1.1. use Pythagoras' theorem, similarity of triangles, and the sum of the angles of a triangle; 1.2. use sines, cosines and tangents (especially for 0°, 30°, 45°, 60°, 90°). Use the trigonometric relationship for triangles: ; c /sinC = b sin B = a/ sin A; $a^2 = b^2 + c^2 - 2bcCosA$ *1.1.* express physical quantities as a numerical magnitude and unit. *1.2.* state the base quantities including their symbols and S.I. units. *1.3.* use base quantities or units to obtain expressions for derived quantities or units. *1.4.* use the Avogadro constant (the number of atoms in 0.012 kg of the C-12 isotope) as a numerical entity. *1.5.* use the concept of the mole as the quantity of substance containing a number of particles equal to the Avogadro constant. *1.6.* use prefixes and their symbols to express multiples (up to 10^9) and sub-multiples (down to 10^{-12}) of units of base and derives quantities. 1.7. use base units to check the homogeneity of physical equations.
2	**Sep 19-23**	**Physical Quantities**	1.1. distinguish between precision and accuracy. estimate the uncertainty in a derived quantity from actual, fractional or percentage uncertainties. 1.2. measure physical quantities using appropriate instruments. 1.3. construct and use calibration curves. 1.4. sketch and recognise the forms of plots of common simple expressions like $1/x$, x^2, a/x^2, sin x, cos x, e^{-x}, $\sin^2 x$, $\cos^2 x$; 1.5. use $\sin\theta \approx \tan\theta \approx \theta$ and $\cos\theta \approx 1$ for small θ and $\sin^2\theta + \cos^2\theta = 1$; 1.6. rearrange relationships between physical quantities so that linear graphs may be plotted.

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			1.7. recognise and use the logarithmic forms of expressions like ab, a/b, x^n, e^{kx} , and understand the use of logarithms in relation to quantities with values that range over several orders of magnitude; . **COURSEWORK – Linearisation & Uncertainties**
3	**Sep 26-30**	**Vectors**	1.8. distinguish between scalar and vector quantities, and state examples. 1.9 combine and resolve vectors. LAB 1 (Density) **Test on Physical Quantities and S.I. Units** **COURSEWORK –Vectors**
4	**Oct. 3-7**	**Motion**	1.1. explain displacement, speed, velocity, and acceleration. 1.2. use graphs to represent displacement, speed, velocity and acceleration in a single dimension. 1.3. use the gradient of and area under motion graphs to solve problems. **COURSEWORK – Objectives 1.1-1.3** 1.4. derive equations representing uniformly accelerated motion in a single dimension. 1.5. use the equations of motion to solve problems on uniformly accelerated motion. 1.6. solve problems involving bodies undergoing projectile motion. 1.7. show that projectile motion is parabolic. **TEST2 - Linear Motion** **Lab 2 – Projectile Motion**

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5	**Oct. 10-14**		1. state Newton's laws of motion. 1.1. explain 'linear momentum'. 1.2. state the principle of conservation of linear momentum. 1.3. apply the principle of conservation of linear momentum. 1.4. distinguish between inelastic and perfectly elastic collisions. 1.5. explain and use the concept of the impulse of a force. 1.6. draw and interpret F-t graphs. 1.7. solve problems related to Newton's laws of motion.
6	**0ct 24-28**	**Test**	1st six week test
7	**Oct 31 – Nov 4**		express angular displacement in radians. 1.1. apply the concept of angular velocity to problems involving circular motion. 1.2. apply the expression $v = r\omega$ to problems involving circular motion. 1.3. use equations for centripetal acceleration and centripetal force. 1.4. use the equations of circular motion to solve problems. 1.5. use Newton's law of universal gravitation in problems involving attraction between masses. 1.6. explain and use the term gravitational field strengths (at the Earth's surface or above). 1.7. solve problems involving circular orbits. 1.8. discuss the motion of geostationary satellites and their applications. **TEST – Circular Motion & Law of Gravitiation**

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			Lab 3 : Circular motion
8	**Nov. 7-11**	**Effects of forces**	1.1. explain the origin of the upthrust acting on a body wholly or partially immersed in a fluid, and use this knowledge to solve problems. 1.2. explain the nature, cause and effects of resistive forces. 1.3. use the concept of terminal velocity to solve problems involving motion through a fluid. 1.4. apply the principle of moments to solve problems. 1.5. use the concepts of static and dynamic equilibria to solve problems. **COURSEWORK –Effects of Forces** **Lab 4 – Forces (Archimedes principle)**
9	**Nov.14-18**	***Conservation of Energy***	1.1 use the concept of work as the product of force and displacement in the direction of the force. 1.2 derive and use the formula for kinetic energy $E_k = ½\ m\ v^2$. 1.3 distinguish between kinetic and potential energy. 1.4 distinguish between different types of potential energy. 1.5 derive and use the formula $\Delta E_p = mg\ \Delta h$ for potential energy changes near the Earth's surface.
10	**Nov. 21-25**		*2.6.* apply the concept of power as the rate of doing work. *2.7.* apply the concept of efficiency to problems involving energy transfer. *2.8.* state examples of different forms of energy. 2.9. describe examples of energy conversion. 2.10. apply the concept of energy conversion to Caribbean situation.

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			2.11. discuss critically mechanisms for the efficient use of energy in the Caribbean. **Test on Conservation of Energy**
11	**Nov 28 – Dec 2**	**Module 2: Oscillation & Waves**	*Simple Harmonic Motion* 1.1. use the equations of simple harmonic motion to solve problems. 1.2. recall the conditions necessary for simple harmonic motion. 1.1. describe graphically the changes in displacement, velocity and acceleration with time and with displacement for simple harmonic motion. 1.3. derive and use the period of the simple pendulum as $T = 2\pi (l/g)^{½}$ and of the mass on a spring as $T = 2\pi (m/k)^{½}$.
12	**Dec 5- 9**	**Test**	*2nd six week test*
13	**Dec. 12- 16**		Revision- Practice Past Papers. END OF TERM – Dec. 18