Curriculum Outline 2024 - 25

Department: Physics

Year 12

Timing	Unit Title	Key Question	Knowledge		Assessing understanding
			Teacher 1	Teacher 2	
Autumn	Measurements and Errors and Materials	What are the definitions? What is the key theory? Can I apply the theory in	 Hooke's Law series & parallel Energy in a spring Young's modulus: stress & strain Properties, F-x graphs 	 Measuring instruments Measuring circus Measurements & units SI units and prefixes Uncertainty 1 Uncertainty 2 Graphs & uncertainty 	 How understanding is assessed Students will be assessed on their ability to: recall the knowledge covered explain the Physical processes covered interpret graphical and experimental data plan and describe valid experiments evaluate experimental procedures and results.
	Mechanics and Waves	order to solve problems?	 Linear equations and vectors Resolving vectors, slopes PE, KE & Conservation Work-Energy Power, efficiency Displacement, velocity, acceleration, scalars Motion graphs SUVAT: 1D problems R P 3: Determination of g Projectiles Newton's Laws: Statics and acceleration Terminal Velocity Momentum & Impulse Momentum & Collisions Moments 	 RP4: Determination of Young's Modulus Wave Basics: Longitudinal + Transverse waves on a string/spring Interference & Superposition Stationary Waves: On a string and in pipes Higher harmonics RP 1: Stationary waves on a string EM waves Polarisation Refraction Fibre optics Diffraction Single slit Double Slit Diffraction Grating 	Skills Description Explanation Comparison Planning and carrying out investigations Manipulating Mathematical Formulae Assessment point information Based on: summer homework home works during the term test on Mechanics test on Waves & Measurements.

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	Electricity		 Charge & Current Energy & Potential 	 White Light Diffraction Patterns RP 2: Interference Effects 	
Spring	Electricity and the structure of atoms Unstable Nuclei Particle Theory	What are the definitions? What is the key theory? Can I apply the theory in order to solve problems?	 Resistance Ohm's Law Ohm's Law Practical Skills Combinations of Resistors (ideal meters) EMF & Kirchhoff's Laws Solving circuits Resistivity Microscopic resistance: Effect of temperature in metals Characteristic Curve of a filament bulb RP 5: Resistivity of a Wire Semiconductor devices Thermistor, LDR, LED, Diode Characteristic Curve of a Diode (LED) Internal Resistance RP 6: EMF and Internal Resistance Thermistor: how does Resistance change as Temperature is varied Cells in Series & Parallel Power in Circuits 	 The atom, specific charge and isotopes Strong nuclear force Unstable nuclei and α and β decay α + β decay, importance of the neutrino Antiparticles pair production and annihilation The four fundamental interactions Exchange particles + Feynman Diagrams Introduction to exotic particles Baryons, mesons and leptons Conservation ideas Strange particles, production and decay Properties of quarks Quark combination of hadrons β+β- decay Destaclastric effect 	 How understanding is assessed Students will be assessed on their ability to: recall the knowledge covered explain the Physical processes covered interpret graphical and experimental data plan and describe valid experiments evaluate experimental procedures and results. Skills Description Explanation Evaluation Comparison Planning and carrying out investigations Manipulating Mathematical Formulae Assessment point information Based on: home works during the term test on Materials and Electricity to date test on Particles to date.
			Potential Divider	Photoelectric effect	

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				 Threshold Frequency and photon model Conclusion/ explanation of the photoelectric experiment Einstein's equation Spectra Excitation and de- excitation of electrons 	
Summer	Electricity and Quantum Physics	What are the definitions? What is the key theory? Can I apply the theory in order to solve problems?	 Sensor circuits: potential divider + component Superconductivity 	 Further evidence of discrete energy levels De Broglie wavelength Electron diffraction 	 How understanding is assessed Students will be assessed on their ability to: recall the knowledge covered explain the Physical processes covered interpret graphical and experimental data plan and describe valid experiments evaluate experimental procedures and results. Skills Description Explanation Evaluation
	Year 2 Start of Course: Thermal Physics and Further Mechanics		 Uniform Circular Motion Centripetal Acceleration Applications to Hills and Bends Applications to Swings Simple Harmonic Motion RP7: Pendulum and Mass spring system SHM and Circular Motion 	 Internal Energy and Temperature Specific Heat Capacity SHC Practical Specific Latent Heat Gas laws RP7: Pendulum and Mass spring system 	 Comparison Planning and carrying out investigations Manipulating Mathematical Formulae Assessment point information Based on: home works during the term internal End of Course Exams.