COURSE INFORMATION **Subject: PHYSICS** **Head of Subject: MR JOHANN FOURIE**

	Year 12	Year 13
Course Content	1. Measurements of physical quantities and analysis of data graphically. 2. Motion, including velocity and acceleration, kinematic equations, vectors and projectiles. 3. Force, mass and weight, Newton's laws, vector nature of force, torque, equilibrium and centripetal force. Hooke's law. 4. Momentum and energy. Conservation laws, impulse, potential and kinetic energy. 5. Static and DC electricity. Electric fields, charge, voltage, current, Ohm's law. Series and parallel. Power and energy. 6. Electromagnetism, magnetic fields, motor effect and induction. 7. Models of the atom (Thomson and Rutherford). 8. Rutherford's gold foil experiment. 9. Nuclear transformations, radioactive decay, half-life. 10. Fission, fusion $E=mc^2$, properties of alpha, beta and gamma.	1. Process uncertainties in data and graphs. Using graphs to identify relationships and constants. Random and systematic error. Lines of best fit. 2. Translational motion, centre of mass, impulse and conservation of momentum in 2D and forces, banked corners, circular motion and centripetal force, rotational and simple harmonic motion. Gravity, kinematics, torque and angular acceleration. 3. Wave systems. Doppler effect, resonance, pipes, strings, harmonics and interference. Spectra and diffraction gratings. * 4. DC, capacitance effect on current and voltage, Capacitance factors, Inductance, current and voltage, time constants and electromagnetism. Faraday's Law and Lenz's Law. Transformers. 5. AC, RMS, power, current and voltage. RC, LR and LRC circuits. Impedance and reactance of AC circuits. Resonance.
Prerequisites	A minimum of 12 credits is recommended from Level 1 Science including the Physics standards.	A minimum of 12 credits in Level 2 Physics is required.
Assessment	**Internals (7 credits)** 91168 Practical assessment (4) 91172 Atomic and Nuclear Physics (3) **External (12 credits)** 91171 Mechanics (6) 91173 Electricity and Electromagnetism (6)	**Internal (4 credits)** 91521 Practical assessment (4) **91525 Modern Physics (3) * Selected scholarship students only.** **External (16 credits)** 91523 Waves (4) 91524 Mechanics (6) 91526 Electricity and Magnetism (6)
Costs	Workbook - $40	Workbook - $40