Physics A-Level Core Content Notes Checklist (7407/7408)

Topics	✓
3.1 Measurements and their errors	
3.1.1 Use of SI units and their prefixes	
3.1.2 Limitation of physical measurements	
3.1.3 Estimation of physical quantities	
3.2 Particles and Radiation	
3.2.1 Particles	
3.2.1.1 Constituents of the atom	
3.2.1.2 Stable and unstable nuclei	
3.2.1.3 Particles, antiparticles and photons	
3.2.1.4 Particle interactions	
3.2.1.5 Classification of particles	
3.2.1.6 Quarks and antiquarks	
3.2.1.7 Application of conservation laws	
3.2.2 Electromagnetic radiation and quantum phenomena	
3.2.2.1 The photoelectric effect	
3.2.2.2 Collisions of electrons with atoms	
3.2.2.3 Energy levels and photon emission	
3.2.2.4 Wave-particle duality	

3.3 Waves	
3.3.1 Progressive and stationary waves	
3.3.1.1 Progressive waves	
3.3.1.2 Longitudinal and transverse waves	
3.3.1.3 Principle of superposition of waves and formation of stationary waves	
3.3.2 Refraction, diffraction and interference	
3.3.2.1 Interference	
3.3.2.2 Diffraction	
3.3.2.3 Refraction at a plane surface	
3.4 Mechanics and materials	
3.4.1 Force, energy and momentum	
3.4.1.1 Scalars and vectors	
3.4.1.2 Moments	
3.4.1.3 Motion along a straight line	
3.4.1.4 Projectile motion	
3.4.1.5 Newton’s laws of motion	
3.4.1.6 Momentum	
3.4.1.7 Work, energy and power	
3.4.1.8 Conservation of energy	
3.4.2 Materials	
3.4.2.1 Bulk properties of solids	
3.4.2.2 The Young modulus	

3.5 Electricity	
3.5.1 Current electricity	
3.5.1.1 Basics of electricity	
3.5.1.2 Current-voltage characteristics	
3.5.1.3 Resistivity	
3.5.1.4 Circuits	
3.5.1.5 Potential divider	
3.5.1.6 Electromotive force and internal resistance	
3.6 Further mechanics and thermal physics	
3.6.1 Periodic motion	
3.6.1.1 Circular motion	
3.6.1.2 Simple harmonic motion (SHM)	
3.6.1.3 Simple harmonic systems	
3.6.1.4 Forced vibrations and resonance	
3.6.2 Thermal physics	
3.6.2.1 Thermal energy transfer	
3.6.2.2 Ideal gases	
3.6.2.3 Molecular kinetic theory model	

3.7 Fields and their consequences	
3.7.1 Fields	
3.7.2 Gravitational fields	
3.7.2.1 Newton's law	
3.7.2.2 Gravitational field strength	
3.7.2.3 Gravitational potential	
3.7.2.4 Orbits of planets and satellites	
3.7.3 Electric fields	
3.7.3.1 Coulomb's law	
3.7.3.2 Electric field strength	
3.7.3.3 Electric potential	
3.7.4 Capacitance	
3.7.4.1 Capacitance	
3.7.4.2 Parallel plate capacitor	
3.7.4.3 Energy stored by a capacitor	
3.7.4.4 Capacitor charge and discharge	
3.7.5 Magnetic fields	
3.7.5.1 Magnetic flux density	
3.7.5.2 Moving charges in a magnetic field	
3.7.5.3 Magnetic flux and flux linkage	
3.7.5.4 Electromagnetic induction	
3.7.5.5 Alternating currents	
3.7.5.6 The operation of a transformer	

3.8 Nuclear Physics	
3.8.1 Radioactivity	
3.8.1.1 Rutherford scattering	
3.8.1.2 alpha, beta and gamma radiation	
3.8.1.3 Radioactive decay	
3.8.1.4 Nuclear instability	
3.8.1.5 Nuclear radius	
3.8.1.6 Mass and energy	
3.8.1.7 Induced fission	
3.8.1.8 Safety aspects	