Switching to OCR from Eduqas

The content within the OCR Physics A specification covers the 'Big Ideas' of physics and will be very familiar. We've laid it out in a logical progression to support co-teaching the AS level and teaching the A level in a linear way.

Items which are in one specification, but not in the other are indicated by square brackets [ ].

OCR Physics A	Eduqas Physics
Module 1: Practical skills Planning, implementing, analysis and evaluation Plus all the skills to be covered in the Practical Endorsement	
Module 2: Foundations of physics Physical quantities S.I. units Measurements and uncertainties Scalars and vectors	**1.1 BASIC PHYSICS** S.I. units and their prefixes Homogeneity using units Scalars and vectors Resolving vectors Estimation of physical quantities
Module 3: Forces and motion Kinematics and dynamics Linear motion Projectile motion Motion with non-uniform acceleration Equilibrium and moments Density [and pressure] Work, energy and power Springs Mechanical properties of materials Newton's laws of motion Momentum	**1.1 BASIC PHYSICS** Density Moments and equilibrium **1.2 KINEMATICS** Displacement, speed, velocity and acceleration Derive equations of motion for uniform acceleration in a straight line Bodies falling in a gravitational field with and without air resistance Projectile motion **1.3 DYNAMICS** Newton's 3rd law of motion Free body diagrams Momentum **1.4 ENERGY CONCEPTS** Work done Conservation of energy Work – energy relationship Power as rate of energy transfer Efficiency **2.5 SOLIDS UNDER STRESS** Hooke's law The Young modulus Classification of solids Features of force-extension graphs

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Module 4: Electrons, waves and photons Charge and current E.m.f. and p.d. Resistivity and resistance Power Series and parallel circuits Internal resistance Potential dividers Wave motion Electromagnetic waves Superposition Stationary waves Quantum physics Photons The photoelectric effect Wave particle duality	**2.1 CONDUCTION OF ELECTRICITY** Charge and current Conduction **2.2 RESISTANCE** Potential difference I-V graphs Ohm's law Power Resistivity [Superconductivity] **2.2 DC CIRCUITS** Application of Kirchhoff's laws Potential dividers Series and parallel circuits E.m.f. and internal resistance **3.1 THE NATURE OF WAVES** Progressive waves Transverse and longitudinal waves Polarisation **3.2 WAVE PROPERTIES** Diffraction with slits or objects Interference and superposition Diffraction grating Stationary and progressive waves **3.3 REFRACTION OF LIGHT** Refractive index and Snell's law Total internal reflection **3.4 PHOTONS** Photons Photoelectric effect and Einstein's equation Atomic energy level diagrams $p=h/\lambda$ for particles of matter and photons [Calculation of radiation pressure on a surface absorbing or reflecting photons] **[3.5 LASERS]** **3.7 PARTICLES AND NUCLEAR STRUCTURE** Quarks and leptons Antiparticles Properties of gravitational, weak, electromagnetic and strong forces Conservation of charge, lepton number and baryon or quark number [Neutrino involvement and quark flavour change exclusive to weak interaction]
Module 5: Newtonian world and astrophysics Temperature Solid, liquid and gas Thermal properties of materials Ideal gases Circular motion Centripetal force Simple harmonic oscillations	**1.5 CIRCULAR MOTION** Period and frequency Radian Angular velocity Centripetal force Equations of motion **1.6 VIBRATIONS** Simple harmonic motion Simple harmonic systems

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Energy of a simple harmonic oscillator Damping Point and spherical masses Newton's law of gravitation Planetary motion Gravitational potential and energy Stars Electromagnetic radiation from stars Cosmology	Graphical representations of S.H.M. Free and damped oscillations Forced oscillations and resonance **KINETIC THEORY** *pV=nRT* pressure exerted by a gas Boltzmann constant **1.7 THERMAL PHYSICS** Internal energy Absolute temperature Heat transfer Work done by a gas Specific heat capacity **2.6 (ELECTROSTATIC) AND GRAVITATIONAL FIELDS OF FORCE** Features of fields Newton's law of gravitation Field strength and resultant field strength Potential and potential energy **2.7 USING RADIATION TO INVESTIGATE STARS** Emission and absorption spectra Black body radiation Stefan & Wien's laws **2.8 ORBITS AND THE WIDER UNIVERSE** Kepler's three laws of planetary motion Derivation of Kepler's third law Evidence for dark matter [Centre of mass for two spherically symmetric objects] Doppler relationship Hubble constant and approximate age of the universe [Critical density of a "flat" universe] **3.4 PHOTONS** Line emission and absorption spectra
Module 6: Particles and medical physics Capacitors Energy stored by a capacitor Charging and discharging capacitors Point and spherical charges Coulomb's law Uniform electric field Electric potential energy Magnetic fields Motion of charged particles Electromagnetism The nuclear atom Fundamental particles Radioactivity Nuclear fission and fusion Using X rays Diagnostic methods in medicine	**2.3 CAPACITANCE** Parallel plate capacitor Capacitance Electric field Energy stored by a capacitor Capacitors in series and parallel Charging and discharging **2.6 ELECTROSTATIC (AND GRAVITATIONAL) FIELDS OF FORCE** Features of fields Coulomb's law Field strength and resultant field strength Potential and potential energy **3.6 NUCLEAR DECAY** Nuclear decay Types of radiation Half-life, activity and decay constant Exponential decay

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Using ultrasound	[Derivation of $\lambda=\ln 2/T_{1/2}$] **3.7 PARTICLES AND NUCLEAR STRUCTURE** Rutherford scattering experiment Coulomb repulsive forces **3.8 NUCLEAR ENERGY** $E=mc^2$ Binding energy Conservation of mass, fission and fusion **3.9 MAGNETIC FIELDS** Force on a current carrying conductor in a magnetic field Force on a moving charge in a magnetic field [Hall voltage] [Field strength for a long straight wire and solenoid] Deflection of ion beams by electric and magnetic fields [Motion of charged particles in linear accelerators, cyclotrons and synchrotrons] **3.10 ELECTROMAGNETIC INDUCTION** Magnetic flux and flux linkage Electromagnetic induction Rotating coil in a perpendicular field **OPTION B MEDICAL PHYSICS** X rays CT scanning Ultrasound Gamma camera Effects of radiation on the body PET scanning [MRI]
Appendix 5f: Mathematical requirements Arithmetic and numerical computation Handling data Algebra Graphs Geometry and trigonometry	Equivalent list in Eduqas as Appendix C

Note:

OCR Physics A does not contain any options, but incorporates Medical physics. Alternating currents are not incorporated in the OCR specification except in term of electromagnetic induction and transformer operation. The 'physics of sport' and 'energy and the environment' may appear as contexts within the OCR assessments, but are not considered in the detail given for Eduqas options.

Assessment

OCR Physics A	Eduqas Physics
AS Paper 1: Breadth in Physics, Modules 1-4 50% of AS Written paper 1hr 30 minutes 70 marks Section A multiple choice questions, 20 marks. Section B short structured questions, covering problem solving, calculations, practical and theory, 50 marks.	**AS Paper 1: Motion, energy & matter** 50% of qualification Written paper 1hr 30 minutes 75 marks A mix of short answer and extended answer structured questions with some set in a practical context.
AS Paper 2: Depth in Physics, Modules 1-4 50% of AS Written paper 1hr 30 minutes 70 marks Short structured questions and extended response questions, problem solving, calculations, practical and theory.	**AS Paper 2: Electricity and light** 50% of qualification Written paper 1 hr 30 minutes 75 marks A mix of short answer and extended answer structured questions with some set in a practical context.
A Level Paper 1: Modelling Physics, Modules 1, 2, 3 & 5 37% of A level Written paper 2 hours 15 minutes 100 marks Section A multiple choice questions, 15 marks. Section B short structured questions, and extended response questions, problem solving, calculations, practical and theory 85 marks.	**A Level Paper 1: Newtonian Physics** 31.25% of qualification Written paper 2 hours 15 minutes 100 marks Section A: 80 marks short and extended answer questions with some set in a practical context. Section B: 20 marks one comprehension question.
A Level Paper 2: Exploring Physics, Modules 1, 2, 4 & 6 37% of A level Written paper 2 hours 15 minutes 100 marks Section A multiple choice questions, 15 marks. Section B short structured questions and extended response questions, problem solving, calculations, practical and theory 85 marks.	**A Level Paper 2: Electricity and the universe** 31.25% of qualification Written paper 2 hours 100 marks A mix of short and extended answer questions with some set in a practical context.

OCR Physics A	Eduqas Physics
A Level Paper 3: Unified Physics, Modules 1-6 26% of A level Written paper 1 hour 30 minutes 70 marks Short structured questions and extended response questions, problem solving, calculations, practical and theory.	**A Level Paper 3: Light, Nuclei and Options** 37.5% of qualification Written paper 2 hours 15 minutes 120 marks Section A: 100 marks A mix of short answer and extended answer questions with some set in a practical context. Section B: 20 marks - choice of 1 out of 4 options: Alternating Currents, Medical Physics, The Physics of Sports, Energy and the Environment.