

# **Edexcel Physics – Course outline**

Experiment = EX Lecture = L Assessment = A

Code Name

Activity

## Section 1 – Motion and Forces

### Module 1 - Speed and Distance-Time Graphs

- 1.1 Scalars and Vectors
- 1.1a Scalars and Vectors
- 1.2 Speed
- 1.2a Speed
- 1.3 **Distance-Time Graphs**
- 1.3a **Distance-Time Graphs**
- 1.3b **Distance-Time Graphs**
- 1.4 Measuring Speed
- 1.4a Measuring Speed

### Module 2 - Acceleration and Velocity-Time Graphs

- 2.1 Acceleration
- 2.1a Acceleration
- $v^2 u^2 = 2as$ 2.2
- $v^2 u^2 = 2as$ 2.2a
- Velocity-Time Graphs and Acceleration 2.3
- 2.3a Velocity-Time Graphs and Acceleration
- 2.4 Velocity-Time Graphs and Distance Travelled
- 2.4a Velocity-Time Graphs and Distance Travelled

### Module 3 - Newton's Laws of Motion

- Newton's 1st Law of Motion 3.1
- 3.1a Newton's 1st Law of Motion
- 3.2 Newton's 2nd Law of Motion
- 3.2a Newton's 2nd Law of Motion
- 3.3 Gravity and Weight
- 3.3a Gravity and Weight
- 3.4.1 Measuring Force and Acceleration
- 3.4.2 Force and Acceleration Experiment
- 3.4.3 Mass and Acceleration Experiment
- 3.4a Investigating the Relationship Between Force, Mass and Acceleration

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- 3.4b Investigating the Relationship Between Force, Mass and Acceleration
- 3.5 Newton's 3rd Law of Motion
- 3.5a Newton's 3rd Law of Motion
- 3.6 Circular Motion
- 3.6a Circular Motion
- 3.7 Inertia
- 3.7a Inertia

### Module 4 - Momentum

- 4.1 Calculating Momentum
- 4.1a Calculating Momentum
- 4.2 Newton's 2nd Law of Motion and Momentum
- 4.2a Newton's 2nd Law of Motion and Momentum
- 4.3 Conservation of Momentum in Collisions
- 4.3a Conservation of Momentum in Collisions

### Module 5 - Stopping Distances

- 5.1 Reaction Time and Thinking Distance
- 5.1a Reaction Time and Thinking Distance
- 5.2 Braking Distance
- 5.2a Braking Distance
- 5.3 Stopping Distance
- 5.3a Stopping Distance
- 5.4 Braking Distance and KE
- 5.4a Braking Distance and KE

### Section 2 – Conservation of Energy

### Module 1 - Conservation of Energy

1.1 Gravitational Potential Energy L 1.1a Gravitational Potential Energy А 1.2 **Kinetic Energy** 1.2a **Kinetic Energy** Α 1.3 **Energy Transfers** L. 1.3a **Energy Transfers** Α 1.4 Energy Conservation, Dissipation and Efficiency Т Energy Conservation, Dissipation and Efficiency 1.4a А 1.5.1 Non-Renewable Energy Resources L 1.5.2 **Renewable Energy Resources** 1.5a **Energy Resources** Α

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# Section 3 – Waves, Light and the EM Spectrum

### Module 1 - Properties of Waves

1.1.1	Transverse and Longitudinal Waves	L
1.1.2	Wavelength and Amplitude	L
1.1.3	Period and Frequency	L
1.1.4	$v = f\lambda$	L
1.1a	Waves	А
1.2	Change of Medium	L
1.2a	Change of Medium	А
1.3	Measuring the Speed of Waves	L
1.3a	Measuring the Speed of Waves	А
1.4.1	Measuring v, f and $\lambda$ for a Wave on a Wire	Ex
1.4.2	Measuring v, f and $\lambda$ for a Wave on Water	Ex
1.4a	Measuring Frequency, Speed and Wavelength	А
1.4b	Measuring Frequency, Speed and Wavelength	А
1.5.1	Waves at a Boundary	L
1.5.2	Reflection (Ray Diagrams)	L
1.5.3	Refraction (Ray Diagrams)	L
1.5a	Waves at a Boundary	А
1.6	Investigating Reflection and Refraction	Ex
1.6a	Investigating Reflection and Refraction	А
1.6b	Investigating Reflection and Refraction	А

### Module 2 - Mechanical and EM Waves

2.1.1	Propagation and Detection of Sound Waves	L
2.1.2	Properties and Uses of Ultrasound	L
2.1.3	Seismic Waves	L
2.1.4	Echo Sounding	L
2.1a	Mechanical Waves	А
2.2.1	The Electromagnetic Spectrum	L
2.2.2	The Uses and Applications of E.M. Waves	L
2.2a	The Electromagnetic Spectrum	А
2.3.1	Investigating the Emission of IR	Ex
2.3.2	Investigating the Absorption of IR	Ex
2.3a	Investigating the Absorption and Emission of IR	А
2.3b	Investigating the Absorption and Emission of IR	А
2.4	The Emission of IR and Temperature	L
2.4a	The Emission of IR and Temperature	А
2.5	Thermal Equilibrium and IR	L
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- 2.5a Thermal Equilibrium and IR
- 2.6.1 Effects of Wavelength and Speed on E.M. Waves
- 2.6.2 Radio Waves
- 2.6a Effects of Wavelength and Speed on E.M. Waves and Radio Waves
- 2.7.1 Waves From Atoms and Nuclei
- 2.7.2 The Hazards of EM Radiation
- 2.7a The Hazards of EM Radiation

### Module 3 - Lenses and Light

- 3.1.1 Convex Lenses
- 3.1.2 Concave Lenses
- 3.1a Lenses
- 3.2.1 Wavelength and Colour
- 3.2.2 Specular and Diffuse Reflection
- 3.2.3 The Colours of Opaque Objects
- 3.2.4 Filters
- 3.2a Visible Light

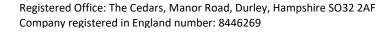
### Section 4 – Radioactivity

#### Module 1 - Atoms and Radioactivity

1.1.1	Atomic Structure	L
1.1.2	Mass Number, Atomic Number and Isotopes	L
1.1.3	The Development of the Model of the Atom	L
1.1a	The Atom	А
1.2.1	Radioactive Decay and Activity	L
1.2.2	Natures and Properties of Nuclear Radiations	L
1.2.3	Nuclear Equations	L
1.2.4	Half-lives	L
1.2a	Radioactive Decay	А

#### Module 2 - Hazards and Uses of Radioactive Emissions

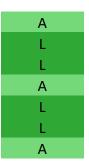
- 2.1 **Radioactive Contamination**
- **Radioactive Contamination** 2.1a
- 2.2.1 **Background Radiation**
- 2.2.2 Uses of Radioactivity
- 2.2.3 Hazards of Radioactivity
- 2.2a Hazards and Uses of Radioactivity
- 2.3.1 **Nuclear Fission**
- 2.3.2 Nuclear Fusion
- Nuclear Fission and Fusion 2.3a



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## Section 5 – Radioactivity

### Module 1 - Space Physics

- 1.1.1 Gravitational Field Strength
- 1.1.2 The Structure and Location of the Solar System
- 1.1.3 Natural and Artificial Satellites
- 1.1.4 The Life Cycle of a Star
- 1.1 Solar System, Stars and Satellites
- 1.2.1 Red-shift
- 1.2.2 Steady-State and Big Bang Theories
- 1.2.3 New Ideas
- 1.2a Red-Shift and the Big Bang

Module 1 - Types of Energy					
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1.1	Energy Transfers and Work
1.1a	Energy Transfers and Work
1.1b	Energy Transfers and Work

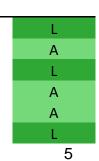
- 1.1b Energy Transfers and Work
- 1.2 Gravitational Potential Energy
- 1.2a Gravitational Potential Energy
- 1.3 Kinetic Energy
- 1.3a Kinetic Energy
- 1.4 Power
- 1.4a Power
- 1.5 Energy Dissipation and Efficiency
- 1.5a Energy Dissipation and Efficiency

### Section 7 – Forces and Their Effects

### Module 1 - Forces as Vectors (Physics and HT only)

- 1.1 Introduction to Forces
- 1.1a Introduction to Forces
- 1.2 Resultant Forces (Collinear)
- 1.2a Resultant Forces (Collinear)
- 1.2b Resultant Forces (Collinear)
- 1.3 Resultant Forces (Non-collinear)

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- 1.3a Resultant Forces (Non-collinear)
- 1.3b Resultant Forces (Non-collinear)
- 1.4 Resolution of Forces
- **Resolution of Forces** 1.4a

### Module 2 - Moments, Levers and Gears (Physics only)

- 2.1.1 Moments
- 2.1.2 The Principle of Moments
- 2.1a Calculating Moments and the Principle of Moments
- 2.2 Levers and Gears
- 2.2a Levers and Gears

### Section 8 – Electricity and Circuits

#### Module 1 - Electrical Quantities

- 1.1.1 Standard Circuit Diagram Symbols
- 1.1.2 **Electrical Charge and Current**
- 1.1.3 Energy, Charge and Potential Difference
- 1.1.4 Current, Resistance and Potential Difference
- Applications of Thermistors and LDRs 1.1.5
- 1.1a **Circuit Quantities**
- 1.2.1 Finding Resistance (General Principles)
- 1.2.2 Finding Resistance (Resistance vs Length)
- 1.2.3 Finding Resistance (Combinations)
- 1.2a **Finding Resistance**
- 1.2b **Finding Resistance**

### Module 2 - Circuits

2.1.1	V-I Characteristic (Resistor)	Ex
2.1.2	V-I Characteristic (Filament Lamp)	Ex
2.1.3	V-I Characteristic (Diode)	Ex
2.1a	V-I Characteristics	А
2.1b	V-I Characteristics	А
2.2.1	Series Circuits	L
2.2.2	Parallel Circuits	L
2.2a	Series and Parallel Circuits	А

### Module 3 - Domestic Uses, Safety and Static Electricity

- 3.1.1 **Direct and Alternating PD**
- 3.1.2 **Mains Electricity**

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- 3.1a Domestic Circuits
- 3.2.1 Electric Power
- 3.2.2 Electrical Energy Transfers
- 3.2.3 The National Grid
- 3.2a Electrical Energy and Power
- 3.3.1 Static Electricity
- 3.3.2 Electric Fields
- 3.3a Static Electricity and Electric Fields

### Section 9 – Magnetism and Electromagnetism

### Module 1 - Magnetic Forces and Fields

- 1.1.1 Permanent and Induced Magnetism
- 1.1.2 Magnetic Fields
- 1.1a Magnetic Fields
- 1.2.1 The Magnetic Fields Around Wires
- 1.2.2 The Magnetic Fields Around Solenoids
- 1.2a Electromagnetism
- 1.3.1 Fleming's Left Hand Rule
- 1.3.2 F = BIL
- 1.3.3 The Electric Motor
- 1.3a The Electric Motor

### **Module 2 - Induced Potential and Transformers**

- 2.1.1 The Size of an Induced Potential
- 2.1.2 The Direction of an Induced Potential
- 2.1.3 Uses of the Generator Effect: Alternators
- 2.1.4 Uses of the Generator Effect: Dynamos
- 2.1.5 Microphones
- 2.1.6 Loudspeakers
- 2.1a Induced Potential and the Generator Effect
- 2.2.1 Structure and Action of a Transformer
- 2.2.2 Turns Ratio Equation
- 2.2a Transformers and the Turns Ratio Equation
- 2.3.1 Step-up and Step-down Transformers
- 2.3.2 Input and Output Currents
- 2.3a Transformers

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## Section 10 – Particle Model

### Module 1 - The Particle Model

- 1.1.1 Calculating density
- 1.1.2 The Particle Model and Density
- 1.1.3 Changes of State
- 1.1a Density and State
- 1.2 Determining Density
- 1.2a Determining Density
- 1.2b Determining Density
- 1.3.1 Internal Energy
- 1.3.2 Thermal Energy and Specific Heat Capacity
- 1.3.3 Specific Latent Heat
- 1.3a Energy of Particles
- 1.4 Thermal Insulation
- 1.4a Thermal Insulation
- 1.5.1 Thermal Properties of Water
- 1.5.2 Thermal Properties of Water
- 1.5a Thermal Properties of Water
- 1.5b Thermal Properties of Water

### Module 2 - Pressure in Gases

- 2.1.1 Particle Motion in Gases
- 2.1.2 Kelvin Scale and Absolute Zero
- 2.1a Particle Motion in Gases and the Kelvin Scale
- 2.2.1 Pressure in Gases
- 2.2.2 pV = Constant
- 2.2a pV = Constant
- 2.3 Increasing the Pressure of a Gas
- 2.3a Increasing the Pressure of a Gas

### Section 11 – Forces and Matter

### Module 1 - Stretching Springs

- 1.1 Stretching and Bending
- 1.1a Stretching and Bending
- 1.2 F = ke (Theory)

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- 1.3 Work Done in Stretching a Spring
- 1.3a Work Done in Stretching a Spring
- 1.4.1 F = ke Experiment (Doing the Experiment)
- 1.4.2 F = ke Experiment (Analysing the Results)
- 1.4.3 F = ke Experiment (Calculating Work Done)
- 1.4a F = ke Experiment
- 1.4b F = ke Experiment

### Module 2 - Pressure

- 2.1 P = F/A
- 2.1a P = F/A
- 2.2 Atmospheric Pressure
- 2.2a Atmospheric Pressure
- 2.3 P = hρg
- 2.3a P = hpg
- 2.4 Upthrust in Fluids
- 2.4a Upthrust in Fluids

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