

Department Curriculum and Assessment Outline

Department: **Electronics** Year Group: **12** Teaching, learning and assessment during the course:

Timing (Weeks, half terms)	Unit Title (as applicable)	Key Question(s) e.g. Why do we need maps and how do we use them? How do quest stories work?	How will we know that pupils can answer the key question(s)? Data that will inform attainment grade	Key Themes of the unit e.g. grammar, processes, events, styles
Autumn 1 + 2	Semi conductor components Logics systems	Construction and principals of operation of semi conductor systems Creating and operating logic systems	End of unit review End of unit test Core component check.	Diodes, work, power, MOSFET, semi conductors, Zener diodes switching circuit AND, OR, NOT, Boolean identities, truth tables
Spring 1	Op amps Signal conversion	Characteristics of operational amplifiers. Why do we need to convert between signal types?	End of unit review End of unit test Core component check.	Op amp, gain, input and output voltage, slew rate Analogue and digital signals, DAC, resolution
Spring 2	AC circuits Comms systems	What are AC circuits and how do they work? Encoding, transmitting and decoding signals.	End of unit review End of unit test Core component check.	Frequency, amplitude, rms, wavelength, inductance, resonance. Transmission, receiver, signal to noise ratio, decibels, bandwidth.
Summer 1 +2	Wireless transmission Instrumentation systems	The use of different radio frequencies to transmit signals.	End of unit review End of unit test Core component check.	EM spectrum, waveform, modulation, line of sight. Binary and Gray coding, slotted discs, angular velocity, op amp.

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		Recognise and design systems to detect information		
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Autumn 1 + 2	Timing circuits Sequential logic systems	Charge and decay of time dependant components Creating and operating logic systems	End of unit review End of unit test Core component check.	Capacitor, discharge, charge, decay time, time constant. AND, OR, NOT, Boolean identities, truth tables, flip flop.
Spring 1	Microcontrollers Digital Communications	Principles of operation and use of microcontrollers. Why do we need to convert between signal types?	End of unit review End of unit test Core component check.	PIC, file register, INTCON, file instructions. Analogue and digital signals, DAC, resolution, PWM, PAM, PCM
Spring 2	Optical Communications Main power supply systems	Encoding, transmitting and decoding optical signals. Producing and regulating mains power supplies	End of unit review End of unit test Core component check.	Frequency, amplitude, rms, wavelength, inductance, resonance, refraction, total internal reflection, refractive index, optical fibre. Zenner, diode, stabalized power supply, current limiting.



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Summer 1	High Power switching systems. Audio systems	Principles of operation of high power systems. Constructing, testing and operating audio systems.	End of unit review End of unit test Core component check.	Triacs and thyristors, phase shift. Summing amplifier, decoupling, active frequency filters, mixer, pre amplifiers, distortion.
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