

Curriculum overview: Electronics

Year 10

Term	Topics covered
Half term 1: Sept- October	<p>Concepts of electronics (Current and Voltage) Symbols and Conventions ,Test Equipment Analysis of Circuits, SI Units and multipliers Ohms' Law / STD form large and small numbers Power calculation,Energy Transfer Conductors /Insulators/ Semiconductors Resistive Components , Series and Parallel resistors Voltage divider calculations, E24 Series Power rating, colour codes, tolerances, Calculating limiting resistors in circuits (eg:LED),Pull up / pull down resistors and switches ,Output devices- buzzer/lamp/LED/motor/solenoid</p>
Half term 2: October- December	<p>Electronic Systems ,Input – Process- Output, Block diagrams Sensing -signal processing conversions Analogue and digital levels inc logic Output drivers – FETs /Darlington Pair / Transistor Applications, AND OR NOT in Systems Basic comparator circuits</p>
Half term 3: January- February	<p>Switching circuits : NPN Transistor N Channel MOSFET Gain: V_{be} I_{be} H_{fe} calculations NPN MOSFET Calculations Gate Drain Source Wiring a transistor as a switch or amplifier Voltage characteristic Comparators – inverting/non inverting Sensing and reference inputs</p>
Half term 4: March- April	<p>Application of diodes Diodes in DC characteristic curve Diodes in AC $\frac{1}{2}$ wave and full wave wiring and waveforms Protecting components and circuits Zener Diodes Graph of reverse characteristic / application Combinational Logic Introduction Logic levels and states</p>
Half term 5: April- May	<p>Basic Gates and truth tables Combinational logic Truth tables and Boolean algebra Design using logic and NAND redundancy Pin outs/ data sheets / pull up and pull down</p>
Half term 6 : May- July	<p>Timing Circuits – capacitors types/ RC calculations How RC affects Voltage time graphs Buffered time delays 555timer IC configurations Monostable applications / pulse / calculations Astable applications / pulse stream/ mark space Waveforms Amplitude/Period/ Frequency</p>

Year 11

Term	Topics covered
Half term 1: Sept- October	Sequential Systems – Rising edge D type flip flop 1-2 bit binary counters Counters / up counters BCD / Binary/ Using 4516 and 4017 counters Timing diagrams / decoder drivers / Seven segment display
Half term 2: October- December	Interfacing digital and analogue circuits why? Pull up and pull down / Schmitt trigger/ switch levels /dead band Debouncing signals/ properties of transistor/ interfacing analogue and digital Comparators/schmitt inverters/ Designing interfaces using NPN/MOSFETs / Comparators
Half term 3: January- February	Control and Micro controllers / interfacing / Applications / inputs -outputs Designing and analysing flow charts Using flowchart commands Using flowchart commands LCD displays Motors/ servo motors / positional control
Half term 4: March- April	Operational Amplifiers characteristics / Impedance / Gain Draw GAIN frequency graphs / Interpret voltage /time graph Inverting and non-inverting / clipping / calculations OP amp as a comparator / mixer/summing amplifier Draw block diagrams using stages eg: input/preamp/mixer/amp/speaker
Half term 5: April- May	NEA Coursework Practical assembly / testing / fault finding

Curriculum overview: XXXX

Year 12

Term	Topics covered
Half term 1: Sept- October	Introduction of Core Concepts Core Concepts Introduction to semiconductors Developing semiconductor theory Semiconductor practice Introducing Logic systems Logic systems Logic Systems
Half term 2: October- December	Logic Systems continued Introducing OP amps OP amps theory and practice OP amps Microcontrollers introduction Microcontrollers practice
Half term 3: January- February	Microcontrollers Microcontrollers Introducing signal conversions A to D conversion Signal conversion AC circuits and passive filters
Half term 4: March- April	AC and passive filters practical AC and passive filters Communication systems Practical communications Communication signals Wireless transmission introduction
Half term 5: April- May	Investigating Wireless transmission Wireless transmission Instrumentation systems Developing instrumentation systems Instrumentation - coded disc and logic Timing circuits introduction
Half term 6 : May- July	Developing timing circuits Timing circuits extended Introducing sequential timing circuits Developing sequential counting Sequential counting Audio systems Practical audio systems Developing Audio systems

Year 13

Term	Topics covered
Half term 1: Sept- October	Introducing Assembler Assembler activity design and programming COMPONENT 3 TASK 1 (COURSEWORK)
Half term 2: October- December	COMPONENT 3 TASK 2 (COURSEWORK)
Half term 3: January- February	COMPONENT 3 TASK 2 (COURSEWORK) Digital Communication Optical Communications
Half term 4: March- April	Optical Communications 2.5 Optical Communications 2.5 Mains power supply 2.6 High Power switching 2.7
Half term 5: April- May	High Power switching 2.7 High Power switching 2.7