



SUBJECT: Curriculum Overview

Year 10

Term	Topic studied	What will I learn?	How will I be assessed?
Year 9 May half term	Engineering Materials Engineering Manufacturing processes Engineering Design and Practical Skills	Crane Project Mechanical systems: • Mechanical Advantage calculation • Gear systems – Gear ratio • Pulley systems – Velocity equation • Pneumatics/Hydraulics – pressure equation • Cams • Linkages (crank and slider!) • 555 timers • Recap Machines - milling, drilling, lathe	Workshop assessment activities: Crane Project Classwork/Homework assessment: • Engineering maths – calculation of materials used and wasted to manufacture product. • Gear ratios • Interpretation of drawings. Series of homework and classwork tasks End of unit written assessment

Year 10 Autumn	Systems (Electrical/Electronic) Engineering Design and Practical Skills	<u>Theft Alarm – LDR Transistor circuit project:</u> Electrical/Electronic systems • AC/DC • Mains/batteries • Microcontrollers • Drivers – transistors/relays • Resistors • Diodes • SI Units • Capacitors • Comparators (op-amp) • Output devices • Input control • Manufacture of PCB – chemical etch & Milling Manufacturing processes: • Additive and removal processes-3d printing - (epoxy and additive, metal sintering, CNC lathe/milling, Mig welding 3d printer) • Vacuum forming • Injection moulding Additional Practical skills:	Workshop assessment activities: • Electronics project e.g. Line following robot to include soldering assessment Classwork/Homework assessment: • Research tasks with written answers • Engineering maths – electronics calculations e.g. Use of ohm's law • Circuit design and use of simulation software
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		Bread boarding, circuit wizard & soldering PCB	
Year 10 Spring	Testing and investigation Engineering Design and Practical Skills	• Volume, area, density, form of supply, cost of manufacture • Calculating percentage waste • Young's modulus/factors of safety • Destructive/non-destructive testing • Practical skills • Problem solving • Analyse and evaluate • Engineering drawings • Production plan • Quality control • Prototyping/modelling • Structure • Stiffness/density •	Workshop assessment activities: Problem solving project and working with structures e.g. Cane project. Classwork/Homework assessment: • Engineering maths –Young's modulus • Production planning • Verbal presentation to class End of unit written assessment

		• Presentation skills • Hydraulics – use syringe for aspects of crane	
Year 10 Summer	Systems (electronic) Engineering Design and Practical Skills Start NEA Task	<u>Preparation for NEA task - A series of bread boarding/circuit wizard exercises.</u> • Logic gates (AND, OR, NOT) • Counter – could be an egg timer project and made on PCB if timer allows • 555 timers • 7 segment display • Piezo sounder • Recap Y9 electronics Start NEA Task	Workshop assessment activities: Several short electronic circuit activities Classwork/Homework assessment: CAD circuit designs and worksheets. Exam style questions (long and short answer)