Engineering

Year 10 & 11

Curriculum Journey

Subject: GCSE Engineering		
Year group: 10		**Exam Board: AQA**
	Content	**Department Assessment**
Autumn Term 1	**Electronics and electrical principles** Students will be introduced to: Electrical principles, e.g. Ohms law, resistance, potential dividers. Electronics components and how they function in circuits. Designing (using a Systems approach), constructing, and testing electronic circuits. Looking at circuit design in terms of input, process, output	Assessment will be through Homework and end of term tests
Autumn Term 2	Using a circuit design package and simulation package eg Circuit Wizard, Picaxe editor Physical, modelling, using prototyping board for circuit construction and testing. **Working with metals.** Students will learn about: workshop processes • cutting • turning • drilling	
Spring Term 1	Quality control methods, working to tolerances, checking using Vernier calipers/micrometer. Following production plans. **Understanding materials such as:** Students will learn about: Polymers, types and properties Composites and reinforcements Timber: structural grade timber, selection and testing, uses Ceramics: advantages and disadvantages Heat treatment of metals. Avoiding corrosion and finishes: Make it go faster? Introduction to the aerodynamic concept of thrust, drag and lift and applications.	

Spring Term 2	Production methods, automation, robotics and their social impact. The environment/pollution in cities, visual impact in the countryside. Making a casting/moulding sand casting , terminology, incl. Building a bridge Calculating factor of safety, weight/load ratio, destructive testing	Assessment will be through Homework
Summer Term 1	Systems: building a small robot Short task using a combination of mechanical and electronic devices, applying knowledge and understanding about: Sensing, using sensors (as available) to detect and measure. Mechanisms: Transmitting power using shafts, gearing systems, belts and pulleys, chains and sprockets. Linkages, push-pull, bell crank, cranks and four bar mechanisms including crank-slider, parallel motion cams and bearings. Pneumatics: single and double acting cylinders, control and check valves.	Short engineered project
Summer Term 2	Mock exam Revision and exam preparation starts Planning for the NEA Problem solving Using a logical and systematic approach to designing Analysing and evaluating existing solutions to problems	Monitoring coursework and providing generic feedback
Homework	Homework will be set weekly, depending upon the modules being taught	
Subject / Department KeyTerms	PEE (Point.Evidence.Explain); WISE (Write.identify.Substitute.Ensure) 123, FLE(Fulcrum, Load, Effort); Iterations; SCAMPER(Substitute, combine, adapt, modify, put to other uses, eliminate, rearrange) cope, drag, pourer, riser, factor of safety; Stress, Strain and Young's modulus; FoS- factor of safety; PIC-peripheral interface controller.	
Recommended Reading / Viewing	My Revision Notes: AQA GCSE (9-1) Engineering Student eTextbook; Paul Anderson, David Hills-Taylor; ISBN: 9781398315297; AQA GCSE (9-1) Engineering Paperback – 29 Mar. 2018; Paul Anderson (Author), David Hills-Taylor (Author), Mark Griffiths (Contributor)	
How can technology help in this subject?	Internet: -research and investigation. CAD – Designing and simulating: circuits; mechanisms and products CAM- for programming CNC machinery to produce products. BBC micro/RaspberryPi /arduino/ -controlling devices.	

Skills required to succeed in this subject…	Problem solving skills; Good English, Mathematical, Coding, investigative, an ability to use tools and equipment safely and accurately; Computer literacy
Vision for this subject…	Pupils will develop their understanding of engineering and go on to study a level 3 engineering or product design course, leading to a career in engineering or designing. This course will provide pupils with skills valued by engineering employers and so it will help pupils towards attaining an engineering, or an allied field, apprenticeship.

Subject: GCSE Engineering		
Year group: 11		**Exam Board: AQA**
	Content	**Department Assessment**
Autumn Term 1	NEA problem description & analysis and specification. Methods of developing ideas. Drawing Techniques Generating design ideas – circuits, systems blocks; including Testing and evaluation. **Loo**king at Mocks-ups and Models Design Development, Mock-ups and Models. Circuits and system blocks; Testing and evaluation. Materials and their properties. Looking at detailing of the solution and producing production drawings - CAD Production of Orthographic Drawings / Production drawing and cutting list Revision-Manufacturing techniques	Coursework monitoring throughout. Providing generic feedback as/per the qualification requirements.
Autumn Term 2	Revision-Manufacturing, Measuring and comparator tools/ mechanical systems/structures Revision-Electronic Systems Y11 AUTUMN EXAMS Production of Orthographic Drawings / Production drawing and cutting list Developing a Manufacturing Specification / Developing Gantt Chart for Planning Production planning Assembly of Materials.	November Mock exam Coursework monitoring throughout. Providing generic feedback as/per the qualification requirements.
Spring Term 1	Production Suggested production methods (alternative methods to manufacture), processes and techniques for making the final outcome Final Hand in (completed CW folder with final Testing and evaluation)	Coursework monitoring throughout. Providing generic feedback as/per the qualification requirements
Spring Term 2	Exam Revision Final Coursework Marks Given	

Summer Term 1	Exam Revision Final Exam	
Homework	Homework will be the reworking of specific pieces of coursework as directed by the teacher.	
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How can technology help in this subject?	Internet: -Investigating and researching iterations CAD – Designing and simulating: circuits; mechanisms and products CAM- for programming CNC machinery to produce products.	
Skills required to succeed in this subject…	Problem solving skills; Good English, Mathematical, Coding, investigative, CAD Draughting skills.	

Vision for this subject…	Pupils will develop their understanding of engineering and go on to study a level 3 engineering or product design course, leading to a career in engineering or designing. This course will provide pupils with skills valued by engineering employers and so it will help pupils towards attaining an engineering, or an allied field, apprenticeship.