KS4 Engineering Curriculum Plan 2014-15

10 hours taught per fortnight

AQA GCSE Specification

http://www.aqa.org.uk/subjects/engineering/gcse

Full details of the units:

Topic	Content summary
Designing and communicating	Use a client design brief To determine the function and user requirements To establish the limits or constraints on a design Convert a client design brief to a specification To specify: size, shape, function, limiting features, functional requirements Use and modify a specification Use the design process to Generate ideas/possible design solutions for engineered products Produce a solution expressed as a drawing/model Simple drawing techniques Orthographic projection – third angle only Isometric projection Manual drawing methods Formal drawing and sketching Scale – 1:1 1:2 1:5 Computer Aided Design 2D using standard conventions either electrical or mechanical 3D solid modelling Using a computer program to simulate the operation of an electrical or mechanical system Explain a design proposal to a third party Use drawings or models to present ideas Respond to client feedback
Understanding engineered products	Materials • Polymers • Ferrous metals • Common non-ferrous metals and alloys • Composites • Ceramics Materials, Technologies and Design Considerations Ability to be: • shaped and formed • machined • treated • given a surface finish • re-cycled and re-used Comparative ease of handling, cost, availability and form Components • Mechanical • Electrical and electronic • Pneumatic/hydraulic

	Production methods including mould and jig use
Manufacturing an Engineering Product	Produce production plans Manufacturing to a production plan, which is related to the production of a "one–off" or limited batch production of an engineering product Using tools and equipment Understanding the reasons for the selection and use of specified materials, components, processes, tools and equipment Working safely Identification of Health and Safety issues including the use of Personal Protective Equipment Quality issues – tolerances and using accurate measurement systems Planning and organisation – organising the work, planning sequences of operations Analyse and revise the completed project, taking into account how it could be improved Engineering Processes: Including material removal, shaping and manipulation, joining and assembly, heat and chemical treatment and surface finishing including the following: Machining operations Turning Milling or routing Drilling Cutting e.g. sawing, shearing shaping casting forming bending or vacuum forming joining Rivet, threaded fasteners, welding and soldering Surface finishing Painting, plating, surface finishing
Application of New Technologies	CNC cutting limited to two axes, e.g. vinyl or laser cutters, drilling or profile cutting or milling Printed Circuit Board. Impact of Modern Technologies Describe the impact of modern technologies: • when engineering a product • on engineered products • on engineering industries • on the stages of engineering a product. Describe the advantages and disadvantages that the use of modern technology has brought to society, including environmental issues and sustainability. Investigate a range of engineered products to determine the impact of modern technology on design and production methods.