Engineering

QEGS Engineering workshop programme

Course Length: Studied over one year (90hrs)

Course Leader: Mr M Kershaw (Kershaw@queenelizabeths.derbyshire.sch.uk)

Why study this Engineering Workshop Programme?
Our own in-house Engineering Workshop Programme will allow exposure to a variety of technical areas and skill sets used on a typical shop floor engineering environment. You will become competent in workshop practice including marking out, sheet metal fabrication, MIG welding, CNC, CAD design and secondary machining such as lathe work and milling machine operation. This programme has been introduced to act upon feedback from Industry experts to address some of the key skill sets missing from applicants entering into Engineering as a profession from further education.

Where can this Programme take me?
Your completed Programme gives you the relevant skill sets to support an engineering apprenticeship application. The Workshop Programme also provides you workshop skills and experience to support your Engineering degree as it is now common practice for degree courses to not include any workshop practice in the subject. This is a major concern as students miss out on vital 'shop floor' practical skill sets prospective employers require.

Possible subject combinations: Science, Mathematics, Further Mathematics and Engineering Workshop Programme.

Course Content

The topics studied are:

1) Manufacturing Secondary Machining Processes
In this unit you will:
- Examine the technology and characteristics of secondary processes that are widely used in industry
- Set up traditional secondary processing machines to manufacture a component safely
- Carry out traditional secondary machining processes to manufacture a component safely
- Review the processes used to machine a component and reflect on personal performance

2) Technical Drawing
In this unit Orthographic projection to BS308 and BS8888 standard / Oblique and Isometric drawing will be covered. You will:
- Develop two-dimensional computer-aided drawings that can be used in engineering processes
- Develop three-dimensional computer-aided designs to be used in CNC engineering processes
- Carry out engineering processes safely to manufacture a product from your drawings (additive and reduction manufacturing)

3) Engineering Product Design and Manufacture
In this unit learners will explore engineering product design and manufacturing processes and will complete activities that consider function, sustainability, materials and form. You will:
- Learn about the properties and characteristics of a range of ferrous / non-ferrous / polymer and composite materials
- Engage with the 5 steps of the Engineering design and make process
- Carry out a design and make exercise

4) Basic Bench work skills
In this module you will:
- Learn how to measure and mark out across a range of materials accurately using a range of tools and equipment such as angle plate / V-block /surface plate / surface gauge
- Apply correct technique to cut and work with both hand tools and power tools such as scribes, jenny calipers, angle grinders, air saws, nibblers
- Understand the requirement for appropriate fasteners, fixtures and components, screw thread systems, screw thread nomenclature.
- MIG welding / spot welding fabrication
- Apply safe working procedure as to HASAWA law

All 4 topics within the workshop programme will be assessed through a number of practical and written assignments. A photographic record and written log book will be undertaken by each student to show potential employers and institutions to support A Level subject work.

Assessment

Topic	Title	Assessment	
1	Manufacturing Secondary Machining processes	Submitted work to deadlines set	30 GLH
2	Technical Drawing	Submitted work to task set	15 GLH
3	Engineering Product Design and Manufacture	Submitted project to deadline set	10 GLH
4	Basic Bench working skills	Submitted work to practical tasks set	35 GLH