Curriculum Overview: L2 Engineering – Year 9

Year 9 Autumn Term 1		
What are we learning? BTEC Tech Award in Engineering Level 1/2 **Component 1A** – Exploring Engineering sectors and design applications.	**What knowledge, understanding and skills will we gain?** Knowledge • Students will explore interconnection between engineering sectors, organisations and job roles Understanding • To undertake research of different engineering sectors. • To make links between different sectors in engineering. Skills • To research using engineering websites, to record specific roles and identify processes and methods of manufacturing. • To interpret information from flow charts, diagrams and researched information.	**What does excellence look like?** • The ability to produce written commentary with block diagrams or flow charts (or other similar evidence) to show an understanding of cooperation between engineering sectors for a given product. • To present a detailed evaluation of why / how an engineered product is made collaboratively by a number of different organisations of different sizes. • The ability to show a detailed understanding of specialist engineering organisations in given sectors and the reasons why they are needed when producing a complex product. • To be able to present detailed reasons why engineers different sectors, such as mechanical and electrical/electronic, cooperate to produce an engineered product that contains numerous components that link together.

Year 9 Autumn Term 2		
What are we learning? Component 1A continued- Using engineering skills students will: • Define a problem • Develop possible solutions • choose a solution • Evaluate the project outcomes.	What knowledge, understanding and skills will we gain? Knowledge • Students will identify an organisation and from its website explore its role in the UK and abroad if relevant and to investigate job roles and career progression opportunities from that sector. Understanding • To identify links between different organisations and how they manufacture certain components and assemblies. • To identify specific organisations to find out about the structure, the departments, job roles and career progressions. Skills • To show evidence of clear interconnectivity of organisations and their roles in designing and manufacturing components and assemblies.	What does excellence look like? • The ability to present detailed explanations of why certain job roles are required when producing an engineered product so that activities can be carried out at the correct time and in the correct manner, and the skills of those involved are best utilised. • The ability to evaluate the strengths and weaknesses of different manufacturing organisations and come to conclusions as to why they are suitable for manufacturing specific components.

Curriculum Overview: Engineering

Year 10 Autumn Term 1			
What are we learning?	What knowledge, understanding and skills will we gain?	What does excellence look like?	What additional resources are available?
Component 2 Aim A Investigating an engineered product	**Knowledge** • Component identification • Material identification • A range of processes used in the manufacture of an engineered product **Understanding** • Why specific components are used • The difference between proprietary and standard components **Skills** • Assembly and disassembly • Identifying key features • Using weighing and measuring equipment	• Enthusiasm • Well-presented work • Skilful and accurate use of tools and equipment • The ability to identify the materials and processes involved in the manufacture of a component and justify the use of both material and process • Confident assembly and disassembly of an engineered product.	PowerPoints Microsoft Teams Template for coursework Assessment criteria break down Digital scales Micrometre Digital callipers

Curriculum Overview: Engineering

Year 11 Autumn Term 1			
What are we learning?	What knowledge, understanding and skills will we gain?	What does excellence look like?	What additional resources are available?
Component 3 Exam unit	**Knowledge**	• Enthusiasm • Analytical responses	PowerPoints

Responding to an engineering brief	• How to record data in a range of ways • Different engineering materials **Understanding** • How to develop existing designs • How to analyse data **Skills** • Recording the results from a process with precision and accuracy • Interpreting data • Following plans • Assembling • Using materials, equipment and machinery • Analysis of designs and results data	• Thorough detail when recording and evaluating results • Clear presentation • Accuracy and skill when working • Fluent use of skill in complex situations • Fully address all objectives	Microsoft Teams Template for coursework Past papers and synoptic assessments Mark scheme

Curriculum Overview: Engineering (Foundation Tech-Level)

Year 12 Autumn Term 1			
What are we learning?	What knowledge, understanding and skills will we gain?	What does excellence look like?	What additional resources are available?
Critical analysis of different products and finding solutions to problems.	**Knowledge** • Product analysis and comparisons. • Product design. **Understanding**	Clear and concise product analysis using the SWOT method.	Teams Computers/internet Fusion 360 or OnShape

	• Being able to find flaws in a product and design ways to prevent this in future. **Skills** • Critical study of a product. • 3D design and testing.	Using teams to submit work and to review feedback. Completion of new ideas using bot sketching and computer aided design.	A3 paper and drawing equipment.

Curriculum Overview: Engineering (A/AS level)

Year 13 Autumn Term 1			
What are we learning?	What knowledge, understanding and skills will we gain?	What does excellence look like?	What additional resources are available?
Problem solving using computer aided design.	**Knowledge** • Transform an idea into a 3d object. **Understanding** • Understanding the processes of parametric modelling. **Skills** • Sketching and CAD work.	Clear communication of an idea using a graphical interface. Using onshape to share work that is to a high standard. Completion of a 3d part with no over dimensioning.	Teams Computers/internet Fusion 360 or OnShape A3 paper and drawing equipment.