Engineering Single and Double at Samuel Whitbread Academy

Intent	BTEC Nationals Engineering at Samuel Whitbread is aimed to give students the taste of the engineering world through design, development and manufacturing. We aim to develop, and inspire students to demonstrate that development and learning new skills is crucial to developing themselves and the world around them. Our KS5 curriculum aims to develop the students' understanding of materials science, from metals through to composites. To understand, develop and practice manufacturing methods that are crucial to work in the engineering sectors, to delve into mathematics and physics to analyse and solve engineering problems and Lastly, to develop design skills to stretch from paper to computer. Our curriculum focuses on not only individual engineering endeavours but also how to engineer successfully as a team, building those crucial skills of communication between peers, making use of feedback to construct and develop their engineering products. The intent of our engineering department is to create ready engineers who are able to progress onwards into their field of study or work, where they will feel comfortable and excel with their knowledge and understanding.
Implementation	The implementation of the BTEC Nationals Level 3 Engineering is split into a series of modules, depending whether they are taking the single or double course. If you are studying the Engineering Nationals Diploma (720 GLH) - Or commonly known as the double engineering option, you will study the additional 6 units

Implementation	**Key Stage 5: Level 3 Nationals**	**Unit 1 - Engineering Principles -** Exam Unit - revolving around long and short answered questions relating to engineering contexts and data presented. Problems focus on mathematical techniques, electronic and electrical knowledge, and mechanical principles. **Unit 2 - Delivering Engineering processes safely as a team -** Team project exploring engineering design, planning and manufacturing of products safely in the workshop environment. Using processes such as; Cutting, Filing, Brazing, Sand Casting, Milling, Welding and more. **Unit 3 - Design and manufacturing -** Exam Unit - Interpretation of data and product requirements to redesign a given object. Design and development skills which make use of Isometric, Orthographic and section drawing skills, finishing up with critical and evaluative techniques against specification. **Unit 10 - Computer Aided Design -** Creating solid body items and products, assembly techniques and rendering with realistic materials. Engineering drawings using layers to represent different manufacturing methods. Sheet metals digital fabrication to create objects that can be folded and unfolded.
	Key Stage 5: Nationals Diploma	**Unit 4 - Applied Commercial and Quality Principles in Engineering** - Learners explore commercial engineering, for example key business activities, cost control, quality systems and value management, which is used by engineering organisations to create value. **Unit 5 - Specialist Engineering Project** - Learners apply project-management principles to undertake a 30-hour individual project and will produce a product, system or process relevant to their specialist area of study. **Unit 58 - Energy Management -** Learners will investigate the uses of energy in organisations and concepts of energy management. They will examine the increasing requirement to conserve energy and identify ways of using energy in a more efficient and effective manner. **Unit 24 - Maintenance of Mechanical Systems -** Learners will explore the processes and components associated with the maintenance of mechanical systems and undertake maintenance tasks on a mechanical system. **Unit 8 - Further Engineering Mathematics -** Learners use algebraic and statistical methods to carry out mathematical modelling and analysis to solve engineering problems. **Unit 44 - Fabrication Manufacturing Processes** - Learners explore and carry out fabrication processes to safely manufacture products from sheet metal.

Impact

The exam unit(s) assessment happens twice a year, in January and May/ June. Students are allowed two attempts at each external assessment.

The coursework units are broken down into three components; A, B & C (Some units also have a D section). The learning for each component will be taught and then the assessment period for the component will start. At the end of the allocated time, the component will be marked and feedback given to the students. Where the learning for the next component will then be taught.

Once the students have been given their initial grade for a component they will have 15 working days to improve their work and resubmit to improve their grade.

The External units (exams) are marked as the following grades;

	Unit size	
	90 GLH	**120 GLH**
U	0	0
Near Pass	6	8
Pass	9	12
Merit	15	20
Distinction	24	32

With Internal Units, and coursework, the following allocations are made;

	Unit size	
	60 GLH	**90 GLH**
U	0	0
Pass	6	9
Merit	10	15
Distinction	16	24