

DT	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 9 BTEC Tech-Award Engineering	<p>STEM (team) Competition. Through this STEM initiative students will be introduced to the complex study of Engineering, and will be able to transfer skills, knowledge and prior learning from other areas of the curriculum into their projects (Technology, Science, History and Maths). They will study; ancient siege weapons, mechanisms, forces, trajectory, the Space Race, gravity and velocity. They will be expected to work in teams to solve a 'Great Egg Race' style challenge. They will make a visit to Hethel Innovation Centre to view engineering business enterprise in action. The unit will culminate in a</p>	<p>Trophy Project. This project will be their first experience of the expectations of the examinable components of the course. Students will design and manufacture to a given brief. They will be expected to conduct research, produce annotated ideas, manufacture from a prepared working drawing. Then use their skills to produce their individual solutions for the topside of the trophy. They will use a range of materials: Wood – Metal - Plastic - Smart. They will complete the project with an evaluation of all aspects of the project; their performance and the quality of the outcome. Skills:</p>	<p>Aluminium Soft jaws - FPT Knowledge: Working properties of non-ferrous metals. Work hardening Skills: Cutting and shaping metal</p> <p>Adjustable Bevel - FPT Skills -2D Design CAD - Marking out +/- 1mm - Cutting and shaping - CAD / CAM Laser cutting – Riveting – Brazing - Plastic dip coating - Introduction to Fusion 360</p>	<p>Stationery Project. 2D / 3D CAD. This project will enable students to combine all of the technical skills and knowledge that they have gained so far in KS3 to be able to move forward to the examinable components with confidence. They will have an opportunity to practice what they have done previously and enhance their technical knowledge further. They will be required to work to a given brief, analyse the brief, and produce a list of design criteria and research existing products. From this they will produce a range of annotated sketches and then developed ideas that will be</p>	<p>Component 1 Learning aim B. Official BTEC assignment. Key skills: Interpreting an engineering brief - Research of the given brief. Formulation of design criteria. Proposing initial ideas; annotated and evaluated. Propose a developed idea displaying; creative thinking - development through 3D traditional modelling and 3D CAD, further modification and evaluation. Manufacture a prototype involving careful selection of materials, working from final working and assembly drawings (traditional/CAD) and a manufacturing plan.</p>	<p>Component 1 Learning aim B. Official BTEC assignment. Key skills: Interpreting an engineering brief - Research of the given brief. Formulation of design criteria. Proposing initial ideas; annotated and evaluated. Propose a developed idea displaying; creative thinking - development through 3D traditional modelling and 3D CAD, further modification and evaluation. Manufacture a prototype involving careful selection of materials, working from final working and assembly drawings (traditional/CAD) and a manufacturing plan.</p>



	competition to test the team outcomes.	Manufacture of base and pillar reading an engineering plan. Laser cutting - Lathe work - Adhesives & fixings thread work - Shaping and finishing. Final product drawn in 3rd angle orthographic. 2D Design / 3D CAD opportunities.		evaluated against their design criteria. They will model their final idea and develop further before producing a final prototype. They will work with a range of materials and CAD/CAM and a full manufacturing plan. They will produce a detailed evaluation and suggest modifications from peer review.	Evaluate and modify based on peer review	Evaluate and modify based on peer review
Year 10 BTEC Tech-Award Engineering	Component 1 Learning aim B. Official BTEC assignment. Key skills. Interpreting an engineering brief - Research Initial ideas - Creative thinking - development through 3D traditional modelling and 3D CAD. Selection of materials - Final working and assembly drawings. (Traditional and CAD) -Peer review	Unit 2 LAA Investigating Engineered products (Bike brake).	Unit 2 LAA Investigating Engineered products (Bike brake).	Unit 2 LAB Learning engineering through disassembly techniques. (multitool)	Unit 2 LAB Learning engineering through disassembly techniques. (multitool)	Unit 2 LAC Manufacturing an engineered product. (Multitool Part)

Year 11	<p>Component 2: Investigating an Engineered Product. Learners will investigate the selection of materials, proprietary components, making processes and disassembly of a given engineered product. They will plan, reproduce, inspect and test a single component.</p>	<p>Component 3: Responding to an Engineering Brief. Learners will investigate and create solutions to problems in response to given engineering briefs. Mock Exam Preparation</p>	<p>Component 3: Responding to an Engineering Brief. Learners will investigate and create solutions to problems in response to given engineering briefs. Mock Exam Preparation</p>	<p>Component 1: Exploring Engineering Sectors. Understand engineering sectors, products and organisations, and how they interrelate.</p>	<p>Component 3: Responding to an Engineering Brief. Learners will investigate and create solutions to problems in response to given engineering briefs. Final Exam Preparation</p>	<p>Component 3: Responding to an Engineering Brief. Learners will investigate and create solutions to problems in response to given engineering briefs. Final Exam Preparation</p>
Year 12 BTEC - LEVEL 3 ENGINEERING	<p>Unit 2 - Delivery of the Engineering Process Safely as a Team - The introductory assignment to all aspects of Engineering at this level, enabling students to build on their acquired prior learning, and develop the essential skills of communication, and teamworking in order to analyse the task - the design and manufacturing of a desk lamp</p>		<p>Unit 3 - Engineering Product Design and Manufacture - A series of structured assignments are issued enabling students to offer individual and collective responses to the design brief - the desk lamp. Students will produce third angle orthographic and circuit diagrams to agreed standards and conventions using CAD software. They will study volumes of manufacture and materials technology in order to make appropriate decisions regarding materials selection and fabrication. they will operate as a team to emulate an SME in the batch production of the desk lamp - ensuring replicability of the manufactured product using; templates, jigs & formers. EXTERNAL EXAMINATION May/June 2021</p>			
Year 13 BTEC - LEVEL 3 ENGINEERING	<p>Unit 1 - Engineering Principles - Students will undertake 120 hours of study for the mathematics of engineering. They will learn and practice; algebra - indices, logarithms, trigonometry and geometry, static and dynamic engineering systems, electrical systems, fluid mechanics, thermodynamic systems, and magnetic systems - EXTERNAL EXAMINATION January, May/June 2021.</p> <p>Unit 10 - Computer Aided Design - Students will study all aspects of draughting with CAD software. They will develop & produce a range of technical drawing; isometric, orthographic, schematics and exploded; they will work with and use with confidence the agreed international conventions and standards. They will learn a variety of rendering methods. They will use document control to keep accurate records for quality assurance. They will study the importance of CAD within all of the systems of Computer Integrated Manufacturing and critical importance of accurate and controlled production of documentation for those systems.</p>					

