CAMBRIDGE NATIONAL IN ENGINEERING MANUFACTURE KEY STAGE 4 CURRICULUM OVERVIEW

By the end of Key Stage 4, students should:

Know	*Core manufacturing processes, engineering materials and their properties, and key manufacturing requirements* *How modern technologies such as CAD/CAM and CNC support engineering manufacture.*
Do	*Use tools, machinery and equipment safely to produce accurate components and products.* *Plan and make a one-off product, including measuring, marking out, and following safe, precise processes.* *Apply CAD/CAM and CNC programming to support effective manufacture*
Appreciate	*The importance of accuracy, quality and safe practice in manufacturing.* *How engineering manufacture links to a wide range of future careers and technical pathways.*

Curriculum coverage

	Topic	*Sub topic*	*Coverage*	
KS4	**Principles of engineering manufacture**	*Manufacturing processes*	*Types of manufacturing processes* *How each process type changes the form of materials to create a product*	*Details of different manufacturing processes*
		Engineering materials	*Mechanical properties of materials* *Other properties*	*Types of engineering materials and how they are processed*
		Manufacturing requirements	*Interpreting orthographic third angle projection drawings* *Influence of the scale of manufacture on the production method*	*Quality*
		Developments in engineering manufacture	*Inventory management* *Lean manufacturing*	*Globalisation*
	Manufacturing of one-off product	*Planning the production of a one-off product*	*Interpret an engineering drawing to identify information to facilitate manufacture*	*Prepare a production plan to manufacture a one-off product* *Carry out a risk assessment*
		Measuring and marking out	*Select and safely use equipment for marking out*	*Select and safely use measuring instrucments*
		Safely use processes, tools and equipment	*Manually controlled machining operations* *Tools and equipment*	*Joining techniques*
	Manufacturing in quantity	*Preparing for manufacture*	*Manufacture and use production aids* *Sequence of operations*	*Operating parameters* *Standard operating procedures (SOPs)*
		Developing programmes to operate CNC equipment	*Use of Computer Aided Design (CAD)*	*Programme CNC machine operations*
		Safely use processes and equipment	*Setting up CNC equipment* *Operating CNC equipment*	*Apply quality control methods for volume manufacture*