

## PCHS Curriculum Information

<b>Course Title:</b> BTEC Level 3 National Extended Certificate in Engineering	<b>Exam Board:</b> Pearson Edexcel	<b>Specification Code:</b> 601/7584/9
<b>How will students be assessed?</b> Equivalent in size to one A Level. There are 4 units of which 3 are mandatory and 2 are externally assessed. <b>The four units are</b> Unit 1 Engineering Principles. Value = $\frac{1}{3}$ of the total qualification Unit 2 Delivery of Engineering Processes Safely as a Team. Value = $\frac{1}{6}$ of the total qualification Unit 3 Engineering Product Design and Manufacture. Value = $\frac{1}{3}$ of the total qualification Unit 10 Computer aided design in Engineering. Value = $\frac{1}{6}$ of the total qualification  Units 1 and 3 are externally assessed in the form of a written exam which students must pass to complete the award. Unit 1 and Unit 3 exams will both be sat in June of year 12 and both can be resat in the following January if needed. <b>Exam content:</b> <b>Unit 1</b> The unit will be assessed through one paper of 80 marks lasting two hours that will be set and marked by Pearson. Learners will be assessed through a number of short- and long-answer problem-solving questions. Learners will need to explore and relate to the engineering contexts and data presented. Assessment will focus on learners' ability to solve problems that require individual and combined application of mathematical techniques, and electrical, electronic, and mechanical principles to solve engineering problems. <b>Unit 3</b> In this unit, students will examine what triggers changes in the design of engineering products and the typical challenges that engineers face, such as designing for safety risks. Students will learn how material properties and manufacturing processes impact on the design of an engineering product. Finally, they will use an iterative process to develop a design for an engineering product by interpreting a brief, producing initial ideas, and then communicating and justifying their suggested solution. They will draw on and apply knowledge and understanding from Unit 1: Engineering Principles and Unit 2: Delivery of Engineering Processes Safely as a Team, for example by using calculations to demonstrate a reduction in mass, by sketching using orthographic projection drawing methods or by justifying an engineering process as its use reduces the carbon footprint of a product.		

## **None examined (assignment submission) content**

### **Unit 2**

In this unit, students will examine common engineering processes, including health and safety legislation, regulations that apply to these processes and how individual and team performance can be affected by human factors. Students will learn the principles of another important process, engineering drawing, and develop two-dimensional (2D) computer-aided drawing skills while producing orthographic projections and circuit diagrams. Finally, students will work as team members and team leaders to apply a range of practical engineering processes to manufacture a batch of an engineered product or to safely deliver a batch of an engineering service.

### **Unit 10:**

In this unit students will use CAD software and hardware to produce 2D and 3D drawings. Students will acquire the skills to produce models of products, editing and modifying these, and exploring materials and their properties. Students will output a portfolio of drawings, for example orthogonal, 3D shaded or solid models, and detail view drawings, to an international standard.

## **KEY CONTENT**

### **Half Term 1 & 2**

#### **Unit 2 Delivery of Engineering Processes Safely as a Team.**

JL x 1 lesson per fortnight *Continuation of this unit from previous term.*

#### **Unit 10:Computer aided design in Engineering.**

Learning Aim A – 3D modeling

Students will select a tool or piece of equipment from the workshop and create a 3D CAD model in Autodesk Fusion 360 using accurate measurements, and representing the real materials.

### **Half Term 3 & 4**

#### **Unit 10:Computer aided design in Engineering.**

Learning Aim B – 2D CAD

Students will recreate a different piece of equipment using techsoft 2D design, building on skills in Unit 2.

### **Half Term 5**

#### **Unit 10:Computer aided design in Engineering.**

Learning Aim C – Thin walled component

Students will use Fusion 360 again this time to create an original design for an acrylic LED light, with folded sides. They will render this in 3D and use special features of the software to create an unfolded view of the product.