**Students studying Engineering Design will learn about identifying market opportunities and solve problems which contribute to the development of new products and systems. Students will also learn practical skills such as drawing, computer modelling and model making to communicate design ideas and product disassembly to identify how products are manufactured and maintained.**

Over the course students will complete one externally set exam worth 25%. This will cover aspects of **Design briefs, design specifications and user requirements.** The exam will be taken early in the course and there will be an opportunity to re-sit at a later date if required.

There will be three units of work in the form of controlled assessment. These are Centre assessed tasks, externally moderated. Each unit is worth 25% (in total 75% of final mark). Some elements will be taught holistically.

**Product Analysis and research**:

* Commercial production methods
* Impact of manufacturing on product design
* End of Life considerations
* Methods of research
* Analyse engineered products through disassembly to identify manufacturing methods, maintenance, materials etc.

**Developing and presenting Engineering Designs:**

* Design techniques i.e. formal, freehand, 3D, 3D rendering, annotations, using ICT
* 2D and 3D Engineering drawing i.e. Isometric, oblique, exploded views, dimensions, orthographic, notes
* Use of 2D and 3D CAD to communicate design ideas
* Techniques to communicate design proposals to clients

**3D Design Realisation:**

* Planning and making prototypes i.e. interpreting specifications, Gantt charts, resources to make prototypes, testing and evaluations
* Safe working practices i.e. hazard identification, risk assessment, safe use of machinery and tools, procedures for working with chemicals. Solvents and materials
* Producing a prototype i.e. handing and shaping a range of prototyping materials
* Recording prototype manufacture and identifying areas for improvements
* Evaluating the success of the prototype and identifying improvements
* Evaluating your own performance considering time management, planning, precision and accuracy and quality.

**Subject: Cambridge National Certificate Engineering Design Year Group: Key Stage 4**

