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OCR Level 1/2 Cambridge National Certificate in Engineering Design (601/1411/3)

Who is this qualification for?

This qualification is for students aged 14–16 who wish to develop applied knowledge and practical skills in designing engineered products.

What will the student study as part of this qualification?

All students will study four topics.

- Design briefs:
  - design specifications
  - user requirements
  - information an engineer needs to start designing a product such as
    - product features
    - manufacturing considerations.

- Product analysis and research:
  - commercial production methods
  - impact of production methods on product design
  - quality and safety considerations involved in production.

- Developing and presenting engineering designs:
  - generating design proposals
  - drawing designs
  - using computer aided design (CAD) software.

- 3D design realisation:
  - planning
  - producing prototype designs/concepts.

What knowledge and skills will the student develop as part of this qualification and how might these be of use and value in further studies?

The students will develop the knowledge and ability to assess clients' design briefs, specifications and user requirements. They will gain knowledge about the design cycle and how to identify client needs. Students will develop an understanding of product requirements, manufacturing considerations, production costs and regulations and safeguards. This will enable the students to complete tasks that are typical of the workplace and demonstrate innovation in their designs.

Students will acquire the ability to research and analyse products. They will understand commercial production methods and will develop the ability to summarise research outcomes. Students will be able to analyse an existing product through disassembly.

Students will develop hand-drawing techniques and know how to use IT software to produce, modify and enrich design proposals. They will acquire the ability to use CAD applications in the production and communication of design proposals.

Students will go on to learn skills in 3D design realisation, including planning and making a prototype, while using safe working practices. They will develop knowledge of the processes, acquire the skills needed to use tools to cut and shape materials and be able to evaluate the success of a prototype.

The applied engineering skills and knowledge that students will gain through this qualification provide a valuable starting point from which students can progress on to a career in engineering or other design careers. It will also be a route to higher study in engineering, design and technology, and art and design courses. The qualification provides useful practical experience to support higher scientific study or higher levels of maths.

Which subjects will complement this course?

The Cambridge National Certificate in Engineering Design is equivalent in size to a GCSE and will take 120 guided learning hours (GLH) to deliver.

The qualification is designed with both creative and practical elements which complement creative subjects such as Art and Design – where hand drawing and computer-based design applications are involved – as well as more practical subjects such as Computing or Business – the skills involved in using software packages, interpreting client requirements and undertaking research and analysis are common to these subjects.

This qualification is part of a larger suite of Level 1/2 Cambridge Nationals in Engineering. The suite also comprises Cambridge Nationals in Engineering Manufacture, Systems Control in Engineering, and Principles in Engineering and Engineering Business.

The Cambridge Nationals in Engineering Manufacture focusses on topics including engineering materials, processes and production, preparing and planning for manufacture, computer aided manufacturing and the quality control of engineered products.

The Cambridge Nationals in Principles of Engineering and Engineering Business focusses on topics such as engineering principles, the engineered business world, sustainable engineering and optimising performance in engineering systems and products.

The Cambridge Nationals in Systems Control in Engineering focusses on topics such as electronic principles, simulation, construction and testing of electronic circuits, engineering applications of computers and process control systems.

In addition to this Certificate in Engineering Design, there is an Award that is 60glh, which is only half of the time it takes to deliver a GCSE, and made up of only two topics, *Design Briefs, design specifications and user requirements* and *Product analysis and research.* Both of these topics are also mandatory in this Certificate and have been outlined above.

This Award will give the student a foundation of some of the essential knowledge and skills involved in engineering design and it is designed to be taken alongside other qualifications.

Schools and Colleges should note that the Certificate-sized qualification is the only qualification size in this suite that is eligible for inclusion in Performance Tables.