

Engineering Design Cambridge National

Overview

Engineering design is a process used to identify market opportunities and solve problems which contribute to the development of new products and systems. This qualification is aimed at learners who wish to study the processes involved in designing new engineered products and the requirements of a design specification. Through research and practical activities, learners will understand how market requirements and opportunities inform client briefs and will use practical skills such as drawing, computer modelling and model making to communicate design ideas.

The Cambridge Nationals in Engineering Design encourage learners to communicate and consult with a client to develop a viable and innovative product. Learners will apply practical skills to produce a prototype in the form of a model and test design ideas to inform further product development. Through reflection, learners evaluate the prototype, making a comparable outcome against specification points, and assess possible, practical solutions and improvements to their prototype design.

A practical approach to teaching and learning will provide learners with knowledge in engineering technology and develop their critical thinking, creativity, and dexterous skills through engaging practical experiences.

Topics

Unit 1 - This first unit provides the opportunity for learners to develop their understanding of the requirements of design briefs and design specifications for the development of new products. Through research and practical activities, learners will understand how consumer requirements and market opportunities inform design briefs. Learners will understand the overall design process through study of the design cycle, existing product and life cycle analysis, study of new and improved materials and manufacturing processes, and how these and other factors influence a design solution.

Unit 2 - This unit will enable learners to perform effective product analysis. They will research existing solutions and assess the development of engineered products. Learners will develop dexterous skills and gain practical experience of product assembly and disassembly to appreciate manufacturing processes, design features and materials used. This unit develops learner's creativity and critical analysis through an understanding of the principles behind good design. They will consider what makes a good product sell by analysing existing solutions.

Unit 3 - This unit develops techniques in generation, concept development and the communication of design ideas using hand rendering and computer-based presentation techniques including computer aided design software. Learners will generate design ideas using a mixture of detailed hand rendering and computer-based presentation techniques including computer aided design in 2 and 3 dimensions. Learners will gain skills in annotation and labelling techniques, such as showing key features, functions, dimensions, materials, construction/manufacture methods.

Unit 4 - This unit requires learners to apply practical skills to produce a prototype product or model using craft-based modelling materials alongside computer-controlled or rapid-prototyping processes. Learners will produce a prototype product in the form of a model and test design ideas in a practical context, to inform further development utilising more complex production processes. Learners will evaluate the prototype making a comparison of the outcome against the product specification and evaluate potential improvements in design such as features, function, materials, aesthetics, and ergonomics and make suggestions on improvements to the final product.

Course Structure

Unit	Assessment Method	Marks
R105 – Design Briefs, design specifications and user requirements	Written exam paper – 1 hour – marked externally	60
R106 – Product analysis and research	Centre Assessed Task completed during lessons– marked internally, moderated externally	60
R107 – Developing and presenting engineering design	Centre Assessed Task completed during lessons– marked internally, moderated externally	60
R108 - 3D design realisation	Centre Assessed Task completed during lessons– marked internally, moderated externally	60

Additional Information & Who to contact

- For more information please follow the link to the course specification on the exam board website <https://www.ocr.org.uk/qualifications/cambridge-nationals/engineering-design-level-1-2-award-certificate-j831-j841/>
- If you require any further information or have any questions, then please contact Mr Thompson Head of Department via email – john.thompson@consilium-at.com

[Click here to return to the list of subjects](#)