

Cambridge National in Engineering Design (L1/L2) (Optional)

Board OCR

This course is an introduction to the industry of engineering design. If you are considering a career in the engineering sector or are interested in the way things work, it's a great choice for you. You will need to have a natural curiosity for taking products apart to explore how they function as well as a passion for creative design to solve real problems.

The course is a great combination of creative drawing and communication skills alongside more technical designing and making skills. You will explore how design engineers work in the real world and get to experience what it is like to be an engineer.

Course Specifics

The course is split into 3 sections: one exam unit (40%) and two coursework units (30% each). These can be re-submitted at key points in the academic year if necessary. Areas of study are not limited to but includes the following topic areas:

- Designing processes (e.g. iterative design and user-centred design)
- Knowing how to communicate design outcomes (e.g. system diagrams or 3D renderings)
- Knowing how to evaluate design ideas (e.g. user testing)
- Production of freehand sketching (e.g. 2-point perspective)
- Production of engineering drawings (e.g. 1st angle orthographic projection)
- Using CAD software (e.g. Fusion 360)
- Product evaluation and virtual 3D CAD modelling (e.g. Blender)
- Physical modelling and manufacturing (using workshop equipment or rapid prototyping 3D FDM printers)
- Product disassembly

This course is suited to students who enjoy both technical and creative challenges and who can work under their own initiative. Much of the course is hands-on and will require a 'can-do' attitude to solve real engineering design problems. The use of computer aided design software is central to the course, as is the necessity to use computer aided manufacturing, combined with more traditional methods, to make small-scale products.

The course is designed to be an introduction to the very diverse field of engineering and would enable students to follow up with a level 3 qualification at sixth form in either engineering (design or manufacturing), product design or any design/manufacturing related qualification. It is especially relevant to our students because of the vast range of engineering companies in and around Bristol. These organisations could be your future employers and we would encourage students to explore work experience opportunities with them too. We will do our best to facilitate this.

It is important to note that the Cambridge Nationals are well-recognised qualifications, fully equivalent to GCSEs in terms of their academic rigour and demand and accepted by academic institutions and employers alike. They have been designed to better reflect the nature of the industry by adopting a hands-on approach that offers several assessment opportunities during the course (January and June), rather than a single summative assessment at the end.

Key things to remember:

- Engineering is a valued profession with many different specialist sectors.
- This course is a broad introduction to engineering design.
- Bristol is an engineering city – there are lots of opportunities for further study, work experience and employment.
- Engineering is more focused on how things work and how we can create effective products and systems.
- It's a good balance of both creative and technical skills.
- You will still design AND make products.
- There is a big focus on CAD/CAM (e.g. 3D designing software and laser cutters/3D printers).
- There are 2 projects which count for 60% of the final qualification. The single exam is worth 40%.
- The Cambridge National qualification is fully equivalent to a GCSE in terms of its level of challenge and scope.

Assessment

The course is split into 3 sections: one exam unit (40%) and two coursework units (30% each).

For further details, please see Mr. Williams