

Core technical qualification

OCR Level 3 Cambridge Technical Extended Certificate in Engineering (360GLH)

What will you be learning?

The four compulsory units are:

- Mathematics for engineering
 - the use of algebra, geometry, trigonometry and graphs
 - exponentials, logarithms and calculus
 - application of statistics and probability in engineering problems
- Science for engineering
 - basic scientific principles of mechanical, electrical and electronic engineering
 - properties of materials
 - basic principles of fluid mechanics and thermal physics
- Principles of mechanical engineering
 - systems of forces and types of loading on mechanical components
 - levers, pulleys and gearing
 - the properties of beams and the principles of dynamic systems
- Principles of electrical and electronic engineering
 - fundamental electrical principles, alternating voltage and current
 - electric motors, generators, power supplies and power system protection
 - analogue and digital electronics

The two additional units are:

- Computer aided design
 - produce 2D CAD engineering drawings and understand the use of simulation tools within commercial CAD systems.
 - produce 3D models and 3D assemblies of components using CAD
 - Materials science
 - understand material structure, classification, properties, and failure modes of engineering materials
 - industrial material processing techniques
 - application and uses of modern and smart materials
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Methods of assessment

Each compulsory unit is externally assessed in a separate 90-minute written exam (four in total). The remaining units are assessed internally through extended assignments.

What are lessons like?

Lessons will be a mixture of theoretical and practical work. The “hands-on” activities will allow students to test theories and to deepen their understanding by allowing them to experience directly the application of engineering principles. There will be use of IT to cover both the independent research and design aspects of the course. It is ideally suited to students who are organised, motivated and who are competent in both maths and physics.

How will we work with employers and the community?

Employers will support teaching and learning by:

- sharing industrial experience and expertise
- providing opportunities to visit engineering workplaces
- setting projects or providing the context for project work
- running workshops in school

There are industrial links with:

- Angus Fire
- Arrow Energy
- Atkinson Vos
- Gilkes
- Hughes Electrical Contractors
- James Cropper Ltd.
- Mardix
- Siemens
- Thomas Consulting
- WDP chartered architects

Where can this pathway lead?

This qualification could provide entry to employment through an apprenticeship in engineering, for example an advanced apprenticeship.

This qualification could also support an application to a degree course in engineering if taken alongside complementary subjects, such as A-levels in maths and physics (or another relevant subject).