

CTEC
Level 3 Extended
Certificate in Engineering

Qualification

Unit No	Unit title	Unit Ref No (URN)	How are they assessed?	Mandatory or optional
1	Mathematics for engineering	L/506/7266	E	M*
2	Science for engineering	R/506/7267	E	M*
3	Principles of mechanical engineering	Y/506/7268	E	M*
4	Principles of electrical and electronic engineering	D/506/7269	E	M*
5	Electrical and electronic design	Y/506/7271	I	O
9	Mechanical design	M/506/7275	I	O

All units are 60GLH

The table below shows the number of points issued for each grade.

Level 3 points table for 60 GLH units				
Unit grade	Pass	Merit	Distinction	Unclassified
Points	14	16	18	0

Qualification grade table

Level 3 Cambridge Technical Extended Certificate (360 GLH)

The table below shows the points ranges and the grades that those ranges achieve.

Points range	Grade	
104 and above	Distinction*	D*
100 – 103	Distinction	D
92 – 99	Merit	M
84 – 91	Pass	P
Below 84	Unclassified	U

Course Content

- ▶ This Level 3, two-year course is designed for students who have an interest in Engineering, having studied either Engineering or a related subject at Level 2 and who wish to progress to a higher level of study. The Cambridge Technical Extended Certificate (CTEC) in Engineering is 360 GLH and is the equivalent of one A level.

Skills Required

- ▶ Good interpersonal skills and a keen interest in Engineering are essential. The majority of the course is assessed through a series of coursework units (6 x 60 GLH for each) with at least four externally examined units and a choice of two further units, either examined or centre-assessed and externally moderated. Whilst elements of the course have practical content, the ability to write coherently and undertake research will be equally important. Students should also be able to demonstrate a sound understanding of Maths.

Unit 1 - Mathematics for engineering

- ▶ *This unit will develop learners' knowledge and understanding of the mathematical techniques commonly used to solve a range of engineering problems. By completing this unit learners will develop an understanding of:*
- ▶ *algebra relevant to engineering problems*
- ▶ *the use of geometry and graphs in the context of engineering problems*
- ▶ *exponentials and logarithms related to engineering problems*
- ▶ *the use of trigonometry in the context of engineering problems*
- ▶ *calculus relevant to engineering problems*
- ▶ *how statistics and probability are applied in the context of engineering problems*

Unit 2 - Science for engineering

- ▶ *This unit will develop the learner's knowledge and understanding of principles of engineering science and consider how these can be applied to a range of engineering situations. By completing this unit learners will:*
- ▶ *understand applications of SI units and measurement*
- ▶ *understand fundamental scientific principles of mechanical engineering*
- ▶ *understand fundamental scientific principles of electrical and electronic engineering*
- ▶ *understand properties of materials*
- ▶ *know the basic principles of fluid mechanics*
- ▶ *know the basic principles of thermal physics*

Unit 3 - Principles of mechanical engineering

- ▶ *By completing this unit learners will develop an understanding of:*
- ▶ *systems of forces and types of loading on mechanical components*
- ▶ *the fundamental geometric properties relevant to mechanical engineering*
- ▶ *levers, pulleys and gearing*
- ▶ *the properties of beams*
- ▶ *the principles of dynamic systems*

Unit 4 - Principles of electrical and electronic engineering

- ▶ *By completing this unit learners will develop an understanding of:*
- ▶ *fundamental electrical principles*
- ▶ *alternating voltage and current*
- ▶ *electric motors and generators*
- ▶ *power supplies and power system protection*
- ▶ *analogue electronics*
- ▶ *digital electronics*

Unit 5 - Electrical and electronic design

- ▶ *The aim of this unit is for learners to develop the ability to be able to apply knowledge of AC and DC circuit theory to circuit design, and to apply a systems approach to electrical design, developing knowledge of the component devices needed to be able to do this. Learners will develop an understanding of the applications of electromagnetism in electrical design, and the ability to be able to use both semi-conductors and programmable process devices in their designs.*

Unit 9 - Mechanical design

- ▶ *The aim of this unit is for learners to develop the knowledge, understanding and skills to be successful in their design of mechanical engineering components and products. Learners will develop knowledge and understanding of engineering drawings, both freehand graphical techniques, and more formal drawing techniques. They will also be able to select the appropriate engineering materials to achieve their design solutions. Learners will be able to produce a design that can be manufactured, successfully, and learn how to optimise a design to improve performance.*