

Engineering



Engineering isn't just about dirty overalls and greasy hands. Today's engineers spend their time solving problems, helping to make the world a better place. They travel the world, working in teams and making use of computers.

Civil engineers are not called 'civil' because they are more polite than other engineers. It's to distinguish them from the original engineers, who were military engineers.

When a new railway system is developed, mechanical engineers design the trains, tracks and signalling systems.

As an engineer, you need to understand a lot of science. But there's more to it than that. Engineers are more concerned with making things work than understanding the science behind the way they work.

To get on an engineering degree course you need good GCSEs, plus at least 2 A-levels, including maths and either physics or chemistry. The starting salary for a graduate engineer is normally between £16 000 and £18 000 — although it can be over £20 000 in shortage areas.

Civil engineers

Civil engineers work on construction projects, both large and small — roads, railways, docks and buildings. Their constructions may have to last for

centuries, so they need to know how to make them stable by using the right materials and building techniques. They also need to understand how water moves, and how gas and oil can be transported.

On any site, many different groups will be at work — including architects, builders, engineers and surveyors. The civil engineer must liaise with all of these and ensure that the project is completed on schedule and within budget.

Mechanical engineers

These are the people who work on designing and building mechanical devices. It's such a large field that mechanical engineers tend to specialise in areas such as automotive, aeronautical or railway engineering. An automotive engineer might specialise further, in fuel-efficient engines, for example.

Some mechanical engineers are busy developing new products. Others are more concerned with research and development, working on new techniques and finding ways of applying them.

Box 1 Who do engineers work for?

Civil engineers

Civil engineering firms, local authorities and government departments

Mechanical engineers

Manufacturing and mining industries, transport companies, governments and universities

Chemical engineers

Chemical, petrochemical, food and pharmaceutical industries

Electrical and electronic engineers

Power generation and distribution companies, telecommunications and media

Box 2 Useful websites

Further information can be found on these websites:

The Royal Academy of Engineering at

<http://www.raeng.org.uk>

The Engineering Council at

<http://www.engc.org.uk>

The Institution of Civil Engineers at

<http://www.ice.org.uk>

The Institution of Mechanical Engineers at

<http://www.imeche.org>

The Institution of Chemical Engineers at

<http://www.whynotchemeng.com>

The Institution of Electrical Engineers at

<http://www.iee.org>

Chemical engineers

Chemical engineers know how to handle different chemical products. They know how to make them react and are responsible for supplying them to billions of consumers around the world. They might be working with crude oil, radioactive waste, sugar or aspirin.

Every chemical, food processing or pharmaceutical plant is designed and operated by chemical engineers.

Electrical and electronic engineers

Electrical engineers deal with all large electrical systems, including power stations, electrical distribution systems and electric motors. Electronic engineers work with electronic and microelectronic systems – anything which includes transistors and integrated circuits (chips). Microelectronic systems are designed using computer-aided methods.

Other branches of engineering

There are many branches of engineering. The main ones are discussed here, but you might be interested in something more specialised – aeronautical, agricultural or recording engineering, for example. There are courses in all these areas at UK universities.

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Box 3 Case study: William Marshall, graduate in mechanical engineering

I studied maths, physics and PE A-levels at Felpham Community College in Bognor Regis. I decided on engineering because it concentrates on applying scientific principles to practical situations.

I did my degree at Brunel University. I chose an MEng course rather than a bachelor's (BEng) because that allows you to become a chartered engineer after a few years of employment.

The best bit of the course was the final-year team project. We developed and validated a software program to help homebuild enthusiasts design their own light aircraft. We made a scale model of an aircraft and flew it. Our design simulation won an innovation prize.

I'm now working as a Fire Engineering Consultant with Jeremy Gardener Associates in London. Fire engineering is a relatively new field. The company has developed fire safety strategies for places like the Bluewater and Lakeside shopping centres. The company is growing, with a new office in Edinburgh, so I'm optimistic that I will get a position of more responsibility before too long.

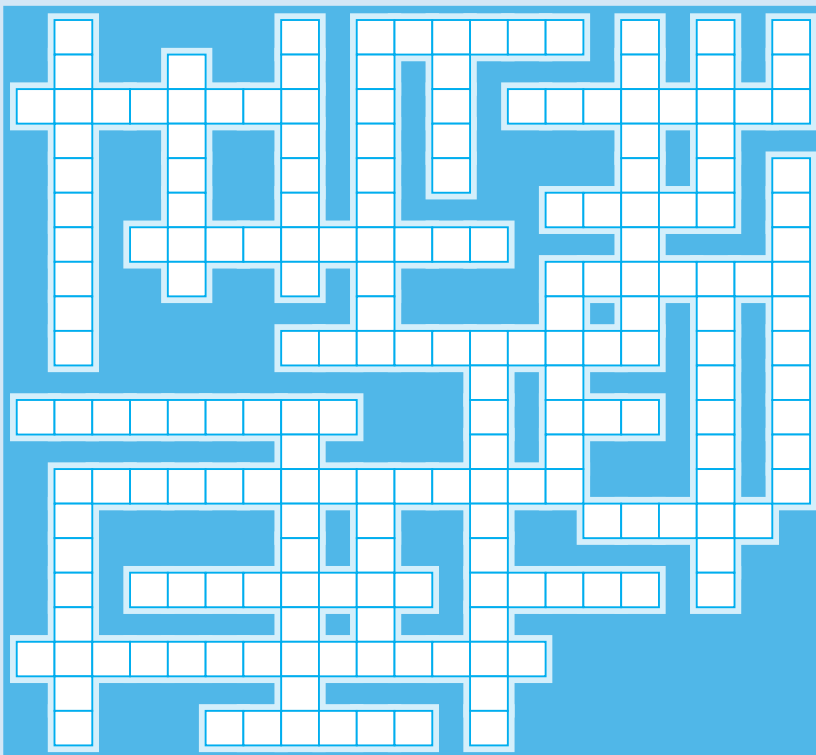
You can find out more about William's project, and Brunel University, at <http://www.brunel.ac.uk/faculty/tech/mechanical/RONCZ/index.htm>



Wordsquare

All the words below have a connection with engineering. Use them to complete the wordsquare.

Puzzle



3-letter words

GAS
JET

5-letter words

CIVIL
RADAR
RADIO
ROADS

6-letter words

BRAKES
CANALS
MARINE
MINING

7-letter words

BIONICS
BRIDGES
TUNNELS

8-letter words

AIRCRAFT
AIRPORTS
CHEMICAL
COMPUTER
HARBOURS

9-letter word

AQUEDUCTS

10-letter words

BALLISTICS
ELECTRICAL
EXCAVATORS
IRRIGATION
MECHANICAL
PRODUCTION
PROSTHESIS
TELEVISION

12-letter word combination

SPACEROCKETS

14-letter word combinations

GUIDEDMISSILES
HYDRAULICPRESS

Answers on page 21.