

# Design Engineer

## Introduction

As a Design Engineer, you will plan and sketch out how machines, equipment and objects will work, look and be made. You'll design lots of different things, like aircraft, bridges, medical equipment, farm machinery, computers and mobile phones.

## Also known as

- Engineer, Design
- Engineering Designer
- CAD Designer
- CAD Engineer
- Draughtsperson
- Product Design Engineer



## Work Activities

As a Design Engineer, you will produce designs for a wide range of products or structures. This could include:

- aircraft
- bridges
- medical equipment
- agricultural machinery
- computers
- telecommunications systems
- products used in the home

You will probably specialise in one area, and will begin each project by looking at a 'brief', which explains what the aim of the project is and what needs to be done to achieve it. A car manufacturer, for example, may want you to increase sales of one of their cars by reducing fuel consumption or improving the way the car looks.

You will be responsible for making sure the product meets the manufacturer's needs and is safe, efficient, reliable, and economical to produce. You must consider what impact it might have on the environment. It is vital that you work within agreed deadlines and to budgets.

Design Engineers gather information by talking to other experts, reading engineering literature and looking at the results of test data on materials and processes before they prepare any designs.

Normally you will use computer-aided design (CAD) techniques to produce a design on a visual display screen. The software then performs all the necessary calculations, for example, relating to the weight of parts and the loads they must bear.

You can compare possible solutions by using drawings, calculations, and physical or digital models. You'll produce specifications for prototypes, to test and evaluate the way a product will work. You may have to adapt your designs as a result of tests.

Design Engineers work in teams alongside other Engineers, Technicians and production staff. You may supervise and lead teams of Design Draughtspersons.

Being able to read, write and speak Welsh may be an advantage when you're looking for work in Wales.

## Personal Qualities and Skills

To become a Design Engineer, you need:

- an understanding of engineering and scientific principles as well as the qualities of metals and other materials
- good number skills, in order to make calculations
- a creative approach to problem solving
- to be patient and willing to change designs several times until you achieve exactly the right result
- good communication skills, so you can explain your ideas clearly to others
- to work well on your own and in a team
- ICT skills, for using computer-aided design (CAD) software
- the ability to work under pressure and to meet tight deadlines

## Pay and Opportunities

### Pay

The pay rates given below are approximate.

- Starting: £31,000 - £33,500
- With experience: £37,000 - £43,000
- Senior Design Engineers earn £47,000 - £51,000

### Hours of work

Most Design Engineers work around 35-40 hours a week, Monday to Friday. However, late finishes and some weekend work may be required, especially as deadlines approach.

### Where could I work?

Employers are firms in all sectors of the engineering industry: mechanical, civil, structural, electrical, chemical, materials, aeronautical and information technology.

Some Design Engineers work for engineering design consultancies. Others work for large manufacturing companies and specialise in designing their products.

Opportunities for Design Engineers occur with employers in towns and cities throughout the UK.

This career could include working for an agency.

### Self-employment

Opportunities occur for Design Engineers to work independently as consultants in private practice.

### Where are vacancies advertised?

Vacancies are advertised in local/national newspapers, on engineering recruitment and employers' websites, and on Find a Job ([www.gov.uk/jobsearch](http://www.gov.uk/jobsearch)).

Social media websites, such as LinkedIn, Twitter or Facebook, are a great way to network, find vacancies and get in contact with possible employers. Make sure that your profile presents you in a professional manner that will appeal to potential employers.

Take a look at our General Information Article 'Finding Work Online'.

GreenJobs is a job board aimed at people interested in green careers:

[www.greenjobs.co.uk/browse-jobs/engineering/](http://www.greenjobs.co.uk/browse-jobs/engineering/)

## Entry Routes and Training

### Entry routes

A Higher Level or Degree Apprenticeship is a great place to start.

Another way to become a Design Engineer is through a relevant engineering degree, foundation degree or HND.

A great way to get into this career is through an internship. Take a look at our information article 'Internships', for more details.

Most engineering courses involve some element of design work, although you can take a specialist course. These have titles such as design engineering, engineering design, industrial design and product design engineering.

Some courses relate design to particular areas of engineering and there are also some combined courses.

It's essential to check college/university websites carefully to make sure the course you choose is appropriate to the branch of engineering you want to follow.

The Institution of Engineering Designers (IED) provides a list of accredited courses relating to design engineering.

### **Training**

Many graduates go on to join graduate training schemes, which offer structured training and experience.

Depending on their level of entry, Design Engineers can gain Chartered Engineer (CEng) or Incorporated Engineer (IEng) professional status. Both are highly regarded by employers throughout industry.

To register as a CEng or an IEng, you must join a relevant, professional engineering institution, such as the IED.

### **Progression**

Depending on their qualification, Design Engineers can progress by taking on more responsibility for the management of engineering projects and teams of engineers.

Some Design Engineers choose to become self-employed or take contract work on a freelance basis.

### **Work Experience**

Previous experience gained in business with a customer focus, are useful for this career.

## **Qualifications**

To get onto a Higher Level Apprenticeship, you will need at least two A Levels, or an Advanced Level Apprenticeship.

To get onto a Degree Apprenticeship, you will usually need at least 2 A levels.

To enter a degree course in design engineering, the usual requirement is:

- 2/3 A levels
- GCSEs in your A level subjects at grade C/4 or above
- a further 2/3 GCSEs at grade C/4 or above
- maths and a science subject (often physics) are normally required at A level
- English, maths and a science subject are usually required at GCSE at grade C/4 or above

A BTEC level 3 national qualification in 3D design will help you to stand out from the crowd and is a good vocational alternative to A levels. The International Baccalaureate Diploma is often accepted. Check college/university websites carefully.

Some universities accept the Welsh Baccalaureate as equivalent to 1 A level.

## **Adult Opportunities**

### **Age limits**

It is illegal for any organisation to set age limits for entry to employment, education or training, unless they can show there is a real need to have these limits.

### **Skills/experience**

Evidence of creative skills, knowledge of computer-aided design (CAD), and skills gained in business with a customer focus, are useful.

### **Courses**

If you don't have the qualifications needed to enter your chosen degree or HND course, a college or university Access course (eg, Access to Engineering) could be the way in.

These courses are designed for people who have not followed the usual routes into higher education. No formal qualifications are usually needed, but you should check this with individual colleges.

### **Distance learning**

Numerous institutions offer undergraduate and postgraduate engineering qualifications via distance learning.

### **Training**

Information on pathways to registration as a Chartered (CEng) or Incorporated (IEng) Engineer can be found on the Engineering Council's website.

### **Sponsorship**

Sponsorship for higher education study in design engineering is available from the larger engineering and manufacturing companies.

### **Funding**

Funding for postgraduate study is available through universities from the Engineering and Physical Sciences Research Council (EPSRC).

## **Further Information**

### **Contacts**

- **Semta**  
Skills for science, engineering and manufacturing technologies  
Address: 14 Upton Road, Watford, Hertfordshire WD18 0JT  
Tel: 0845 6439001  
Email: [customerservices@semta.org.uk](mailto:customerservices@semta.org.uk)  
Website: [www.semta.org.uk](http://www.semta.org.uk)
- **The Engineer**  
Engineering technology news  
Email: [customerservices@theengineer.co.uk](mailto:customerservices@theengineer.co.uk)  
Website: [www.theengineer.co.uk](http://www.theengineer.co.uk)
- **Tomorrow's Engineers**  
Publisher: EngineeringUK and Royal Academy of Engineering  
Email: [contactus@tomorrowsengineers.org.uk](mailto:contactus@tomorrowsengineers.org.uk)  
Website: [www.tomorrowsengineers.org.uk](http://www.tomorrowsengineers.org.uk)
- **Engineer Jobs**  
Publisher: Venture Marketing Group  
Email: [ner@vmgl.com](mailto:ner@vmgl.com)  
Website: [www.engineerjobs.co.uk](http://www.engineerjobs.co.uk)
- **Getting into Engineering Courses**  
Author: James Burnett Publisher: Trotman

Website: [www.mpw.ac.uk/university-guides/getting-into/engineering-courses/](http://www.mpw.ac.uk/university-guides/getting-into/engineering-courses/)

- **Scottish Engineering**  
Scottish enquiries  
Address: 105 West George Street, Glasgow G2 1QL  
Tel: 0141 2213181  
Email: [consult@scottishengineering.org.uk](mailto:consult@scottishengineering.org.uk)  
Website: [www.scottishengineering.org.uk](http://www.scottishengineering.org.uk)
- **Chartered Society of Designers (CSD)**  
Email: [info@csd.org.uk](mailto:info@csd.org.uk)  
Website: [www.csd.org.uk](http://www.csd.org.uk)
- **Getting into Art & Design Courses**  
Author: James Burnett Publisher: Trotman  
Website: [trotman.co.uk/our-books/getting-into-art-and-design-courses/](http://trotman.co.uk/our-books/getting-into-art-and-design-courses/)
- **Engineering Council**  
Address: 246 High Holborn, London WC1V 7EX  
Tel: 020 3206 0500  
Website: [www.engc.org.uk](http://www.engc.org.uk)
- **Engineering Training Council Northern Ireland (ETC NI)**  
Northern Ireland Enquiries  
Address: Sketrick House, Ards Business Park, Jubilee Road, Newtownards BT23 4YH  
Tel: 028 9182 2377  
Email: [info@etcni.org.uk](mailto:info@etcni.org.uk)  
Website: [www.etcni.org.uk](http://www.etcni.org.uk)
- **Engineering and Physical Sciences Research Council (EPSRC)**  
Address: Polaris House, North Star Avenue, Swindon SN2 1ET  
Tel: 01793 444000  
Website: [www.epsrc.ac.uk](http://www.epsrc.ac.uk)
- **Institution of Engineering Designers (IED)**  
Address: Courtleigh, Westbury Leigh, Westbury, Wiltshire BA13 3TA  
Tel: 01373 822801  
Website: [www.ied.org.uk](http://www.ied.org.uk)
- **Careers Wales - Welsh Apprenticeships**  
Tel: 0800 028 4844  
Website: [ams.careerswales.com/](http://ams.careerswales.com/)
- **Hiive**  
Hiive is the online professional network for creative people.  
Website: [app.hiive.co.uk/](http://app.hiive.co.uk/)

## Related Careers

- Systems Engineer
- Manufacturing Engineer
- Diver
- Non-destructive Testing Technician/Specialist
- Production Engineering Technician
- Engineer
- Process Engineer
- Project Engineer
- Quality Engineer
- Safety Engineer
- Site Engineer
- Test Engineer

- CNC Machinist
- Field Service Engineer
- Sales Engineer
- Infrastructure Engineer
- Tunnel Engineer
- Environmental Engineer
- Excavator Operator
- Pipefitter
- Flood Risk Engineer
- Optical Engineer
- Instrumentation Engineer
- Propulsion Engineer
- Radio Frequency Engineer
- Refrigeration Engineer
- Highways Engineer