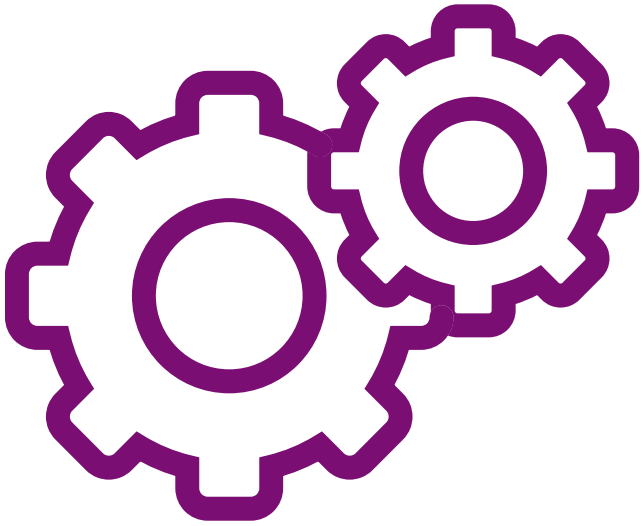
Getting into...
Engineering (Mechanical and Material)



Engineering is developing rapidly, reflected by the growth of new job roles and interdisciplinary fields such as medical and environmental engineering. This is due not only to significant scientific and technological advances, but wider global challenges such as climate change, growing populations and lack of resources.

A vast range of jobs are available in many different branches of engineering, so considering the type of work you are interested in will help you know what you are looking for when job-hunting.

What's in this guide?

Exploring Your Options

In this section we will be talking about the types of roles that exist within the industry, and where you might expect to work. There will be many roles and employers that we don't cover here, but these are some popular examples that you can use as a starting point when exploring your options.

Typical areas

Research, Design and Development

Aims to develop new products or improve the efficiency and performance of existing designs. Computer Aided Design (CAD) is used to develop both new products and production systems by producing technical plans and prototypes. R&D departments are generally found within many forward-looking, innovative engineering and technology organisations.

Academia

Academics conduct and analyse experiments to develop new and better technologies, processes and applications. Universities and other higher education institutions employ researchers to undertake teaching and research. For example, working on cutting-edge areas, such as Nanotechnology or Tribology, which have the potential to help reduce energy consumption and CO2 emissions of machines.

Manufacturing and technical services

Engineers in this type of job plan, design, install, modify and monitor manufacturing and technical processes to produce cost-effective, high quality products and systems. A typical role would be working within control and instrumentation or maintenance departments maintaining equipment used to monitor and control engineering systems, machinery and processes e.g. vehicles, aircrafts, satellites, production systems, energy plants and much more.

Management

Project management involves managing and overseeing the delivery of projects on time and within budget, assigning tasks to the technical engineering team and ensuring client satisfaction. Operations management puts effective methods into place so that the company's day-to-day operations run smoothly. For example, the main responsibilities of an operations manager include handling logistics, preparing budgets and stock, and the supervision of employees.

Regulatory affairs

Is made up of the following areas: Quality assurance engineers monitor and improve the quality of the company's products and minimise production costs by enhancing productivity and efficiency in the manufacturing process. Health and Safety/Inspection jobs are found mainly within industrial and systems engineering, and focus on ensuring that machinery and systems behave in line with safety regulations even when their component parts malfunction or fail. Test engineers are responsible for verifying that products meet the correct specifications. They determine the best way a test can be performed using different processes.

Technical sales and procurement

Sales engineers provide pre- and post-sales technical advice and support. Engineers working in procurement focus on the acquisition of goods, services or works from an external source. The aim in both jobs is for the materials and products to be sold or procured at the best possible cost to meet the needs of the company in terms of quality, quantity, profit, time, and location. In each of these roles it is possible to work 'in-house' for an organisation, or as a consultant, providing technical expertise to clients.

Typical Employers

It is also important to think of the location and type of organisation you would like to work for, as well as your work lifestyle. Opportunities in engineering exist throughout the UK and internationally. Some organisations may base their work entirely abroad, possibly requiring lengthy field trips away from home. Willingness to work outdoors and away from larger cities could be required, particularly for offshore oil jobs. For most jobs you will be working indoors - in offices, laboratories, industrial plants or production sites.

Private Sector

Engineers work across all sectors including small, medium and large companies and corporations in the private sector. This could include working in industry - manufacturing, energy and construction companies in the UK and internationally. Alternatively, a role in the company's headquarters might involve office-based functions like writing project reports.

Public Sector

Opportunities exist in the public sector, typically working for the national and local government or the armed forces. Engineers in the civil service provide expertise for technical policy formulation or implementation, or in areas such as education, construction, and healthcare services. A clinical engineering technologist for the NHS is responsible for the servicing, repair and maintenance of medical equipment. Other public sector agencies such as universities and research institutes also employ engineers for teaching and / or research.

Third Sector

Engineers can also work in the “third sector” (charities and non-governmental organisations e.g. RedR or Télécoms Sans Frontières) using their technical skills to create better living conditions for communities across the globe.

Find out more about this industry by visiting Prospects’ Engineering page. You can also take a look at our Getting into Electrical and Electronic Engineering industry guide.

Getting Industry Ready

What employers are looking for will vary depending on the role, but this is a general overview of key areas you might like to think about. It is important to always read the job description carefully to see exactly what the job responsibilities are, and what skills and experiences are required.

What employers want

Qualifications

Entry into engineering roles is possible with an undergrad degree but some employers require chartered status via MEng or further postgraduate or professional body exams. Read job adverts and person specifications for the roles you are looking to apply for in the future, to identify the level and type of qualification they require.

Employers often encourage professional development, and some may cover tuition fees and grant study leave. See the relevant professional body for information on qualifications required and lists of accredited courses.

Skills

Always read the job description to see what the job responsibilities are, and what skills and experiences are required for that role. Here are some key skills many employers within this sector are looking for when hiring graduates.

Effective communication skills

These are required to draft reports, give technical instructions, share ideas and make presentations. Listening skills are just as essential; engineers need to hear what their colleagues, customers, clients or project partners are saying and build on this to communicate with different audiences.

Analytical, critical thinking, problem-solving skills

Engineers consider various ways of approaching and resolving problems to create feasible solutions. The ability to make professional judgements is essential: this means analysing/ interpreting data and assessing/ managing risks while balancing issues such as costs, benefits, quality, health and safety.

Creativity

This is particularly important in design and R&D roles, where thinking innovatively and laterally can help formulate break-through designs and ingenious solutions.
Team working, management and leadership

Engineering often involves working in large teams with different backgrounds and skill sets, including non-engineers, so teamwork is essential. Engineers who are also project managers must know how to build a team, considering items such as goal setting, communication and collaboration.

Attention to detail

An engineer must pay meticulous attention to detail. The slightest error can cause an entire structure to fail, so every aspect must be reviewed thoroughly and continually during the course of completing a project.

Technical Skills

Machine Learning and Artificial Intelligence is becoming increasingly integrated into Engineering. Rather than replacing traditional roles, Engineers are increasingly using these innovations to aid their work, for example A.I (Artificial Intelligence) algorithms to learn the performance of a prototype car, which can be used to predict the dynamic behaviours of the car in different environments. Getting to grips with common Machine learning languages such as Java, Python, C++ will only increase your appeal to employers, as well as demonstrate your self-motivation and time-management in learning such languages alongside your degree.

Commercial awareness

Commercial awareness is about understanding the organisation you are applying to and the business environment in which they operate. Have an overview understanding of engineering news and trends, know who the key organisations in the industry are, and familiarise yourself with company specific news and projects.

This shows the employer that you are motivated to work for them and their industry, but it also gives you context to help you make informed decisions as an employee.

How to gain relevant skills and experiences

Use your time at university to develop the skills mentioned above. Remember that part-time work, volunteering and involvement in clubs and societies are all opportunities to do this!

Take on responsibility

Take on positions of responsibility, whether voluntary or paid. This could be a Team Leader at work, or a committee member for a university society.

Read job descriptions

Find out what skills recruiters are looking for by reading job adverts.

Follow organisations online

Use social media to see what organsiations are doing and build commercial awareness and your network. You can also look at industry magazines and join professional associations.

Attend events

Attend university or external events to hear from recruiters, develop your understanding of the industry and make new contacts. You can ask these contacts for advice, or even for an opportunity to shadow them in their role.

Get application ready

Update your CV and have a speculative letter ready to adapt should you need to apply for an opportunity at short notice. Book an appointment to get it checked by Careers and Enterprise.

Explore Societies & Competitions

Such as the Formula Student society for students interested in the automotive sector where you will be part of a multi-disciplinary team building a racecar.

How can Careers and Enterprise help you?

There are a number of ways Careers and Enterprise can help you build skills and prepare for applying for opportunities.

Appointments
We have a range of one-to-one appointment types with expert careers consultants. These include Career Guidance appointments where you can talk about your options and ideas, Application Advice appointments where you can have an application or CV checked before submission and Practice Interview appointments where you can practice for an interview you are invited to.

Events
We hold a range of careers events throughout the year where you can learn more about an industry, network with employers and find out what people look for in a graduate.

Programmes
If you are looking to develop your skills, we have several skill-building programmes that you can apply to and complete alongside your studies.

Make the most of work experience opportunities

Once you have found a work experience opportunity, it is important to make the most of it! Here are some things to keep in mind before, during and after the opportunity.

1.Discuss your expectations with the employer at the start, so that you have the same understanding of what the experience will involve.

2.Always be polite, motivated and interested. Work experience can involve boring tasks, but being flexible, helpful and willing to get involved will make a good impression and could lead to more opportunities.

3.Be inquisitive and learn everything you can about the way the organisation works. How do they hire? What key skills are they looking for? What are the main issues affecting the organisation at the moment?

4.Talk to people who work at the organisation and find out what they do and how they got there. You might uncover job roles and employers that are new to you, as well as pick up some helpful tips. Keeping in touch with people you meet can be a great way of finding out about future opportunities and expanding your network.

5.Ask for feedback at the end of the placement to identify your strengths and the skills you need to develop further.

6. It doesn't matter if the work experience in not aligned to the role you may wish to pursue upon completion of your studies, work experience allows you to build and evidence transferable soft skills such as 'relationship building' 'time-management' 'solving challenges' which don't necessarily need to be specific to any industry.

For more information on where you can develop your skills and experiences, see the Resources section.

Finding Opportunities

Work experience

For most roles, work experience is highly valued, if not essential. It builds your skills and convinces future employers of your abilities and commitment to the job. It will give you a better understanding of the industry and of different job roles, develop your commercial awareness and strengthen future job applications, giving you an advantage over other candidates.

It is also an opportunity to build a contacts network, which is valuable when looking for further work experience or graduate jobs. If you want to work in industry also consider business work experience such as a first year insight week. Work experience can also be gained through internships, summer placements and more informal work experience or work shadowing.

Industrial placements

The school of Engineering and Materials Science offers optional industrial experience. A placement is typically 10-12 months working for a company in a paid role. It is fantastic experience for your CV and can count towards the requirements to be a chartered engineer. Sometimes employers hire students who perform well on their placements. Contact the Placement and Careers team in SEMS (School of Engineering & Material Science) for further information.

Plan from your first year

Most large engineering businesses advertise placements a year in advance. It is important to plan to find the area(s) and companies that interest you, so you don't miss deadlines. Placements are competitive and recruiters will look for a combination of good academic results (typically being on track for a 2:1 minimum (with evidence of career commitment and work experience.

They won't be looking for previous work experience in this field, but will want to see a passion for engineering (and the specific sub-area) as well as being pro-active in hobbies, interests, work experience and volunteering outside of your degree. Many employers take applications from students at the start of their 2nd year, so you need to have relevant experiences in your 1st year to include e.g. industrial visits, work shadowing and non-engineering experience like being a Student Ambassador.

Speculative Applications

As well as searching for jobs online, improve your chances by making speculative applications. This is where you contact companies you are interested in directly to ask whether they have any placements or work shadowing opportunities. This is a common method of finding opportunities and can be very effective, as many of these roles will not be advertised. Look for companies that fit your skills and interests, e.g. work in the area you studied for your final project.

You are more likely to be successful if you make your application specific to the organisation and demonstrate your suitability and interest in that particular employer. Although you may see yourself working in a large company, the greatest number of jobs are in small and medium sized companies. Smaller organisations are often more flexible with their recruitment and are more likely to consider work experience positions.

Professional bodies, trade associations & directories

Every branch of engineering has its own professional body or learned society. Many advertise work experience placements and jobs and have directories of their members which you can contact directly for work opportunities. Some are listed below, but a Google search of your branch of engineering with 'institute', 'society' or 'association' will provide further organisations e.g. Royal Aeronautical Society. As a SEMS student, the school will cover the cost of membership to several relevant associations.

Some resources are only available to members, but often reduced student rates are available. Information about courses, training and news is also regularly available and networking and educational events are often organised: these activities are useful for keeping up to date with industry developments (commercial awareness) and developing skills as well as making contacts.

Networking

Attending employer and careers events is another way to find out about companies and get advice from their employees. Build your network by attending talks, insight days, conferences and by being a member of a relevant university student society. Consider becoming a member of a professional body or engineering society to take advantage of their networking opportunities. SEMS holds twice yearly Industrial Liaison Forums for you to network with employers.

Twitter, LinkedIn, and Facebook can be valuable tools for keeping up to date with careers information, events, news and jobs. Create/update your LinkedIn profile and find interesting LinkedIn groups to join and like relevant pages on Facebook. SEMS holds twice yearly Industrial Liaison Forums for you to network with employers.

Resources

QM Careers Hub
A range of roles across all industries. Remember data and analysis vacancies will exist across all sectors.

GradCracker
A range of roles for STEM students for both placements and graduate positions. Able to filter by disciplines (Materials, Aerospace etc. and subdisciplines within this). Many Employers also run their own insight webinars on Gradcracker as well as have their specific portal with further resources to get to know the company.

Civil Service
Vacancies, work experience opportunities and list of departments eg Defence Science and Technology Laboratory

Earthworks
Vacancies include renewable energy, environmental engineering, oil and gas

Engineer Board
Opportunities in all branches of engineering plus, Fast Moving Consumer Goods (FMCG), utilities, energy and water.

Jobs.ac.uk
Academic, research and support positions in all fields

Just Engineers
UK and Worldwide jobs including mechanical, structural, electrical, gas, oil and more. Browse jobs by sector or location.

NHS Careers
Job profiles, training programmes and job listings

Target Jobs
A range of graduate jobs, schemes and internships advertised. Careers and application advice.

Fish4jobs (previously The Career Engineer)
Vacancies in a range of industries with a range of graduate jobs available.

The Institute of Mechanical Engineering (IMechE)
Provides news, events and detailed industry information.

The Institute of Materials, Minerals and Mining
Provides news, publications, grants and networking opportunities with advice on how to find work experience.

Institute of Chemical Engineers
News, events and resources plus placement opportunities. See careers video: www.rsc.org/careers-jobs

Aerospace Defence Security Group
Trade association for the aerospace, defence and security industries, with company directories for each category.

Association of Consultancy and Engineering
Jobs board, news and resources plus undergraduate research bursaries (apply via School).

Association of British Healthcare Industries
Medical technology sector news, resources and member directory.

UK Science Park Association
Advertises vacancies in UK science parks.

Institute of Physics and Engineering in Medicine
Provides sector news and information, links to related societies and a job board.

Institute of Energy
Careers information plus search members directory.

Royal Academy of Engineering
Academic community of engineers. Includes the latest news and events to advance and promote engineering.

The Engineer
Provides industry news, product news, video, blogs, podcasts, webinars and forthcoming events.

Engineering Council
Regulatory body for the engineering profession which maintains internationally recognised standards of professional competence and ethics. The website includes industry news and details of course accreditations.