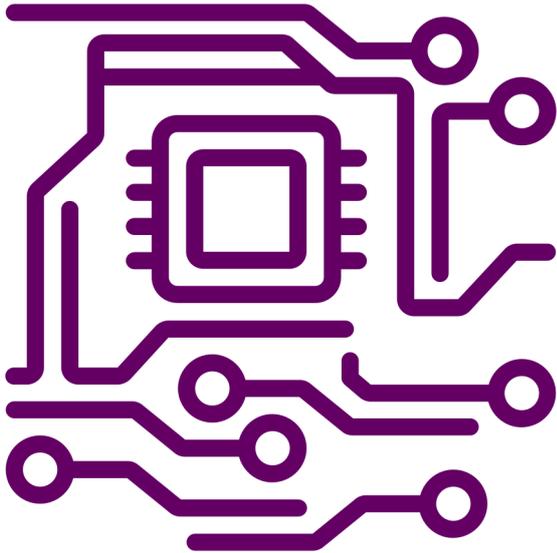


Getting into...

Engineering (Electrical and Electronic)



New job roles and specialisms are developing in this field, due to technological advancements across many different areas.

Complex technology and systems are required to support the increasing virtualisation of our communication and work habits – with things like remote working and entertainment streaming making technology more important than ever.

What's in this guide?

Part One Exploring Your Options	1
Part Two Getting Industry Ready	3
Part Three Finding Opportunities	8
Part Four Resources	10

Exploring Your Options

In this section we will be talking about the types of areas that exist with electrical and electronic engineering, 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 discover and create new innovations and/or improve the efficiency and performance of existing products, methods and services. Opportunities in software research, design and development can be found in a variety of industries. There are a growing number of opportunities within media and entertainment, with changes in areas like broadcasting and streaming. Example job titles include: Acoustic Consultant, Broadcast Engineer and Design Engineer.

Manufacturing and technical services

Here engineers design, install, modify and monitor manufacturing and technical processes. Production and processes are becoming increasingly digitised e.g. smart factories and 3D printing. Control and instrumentation engineers maintain equipment used to monitor and control engineering systems for machinery. Mobile phone companies and networks are a notable example of employers within this area. Example job title: Machine Learning Engineer.

Transport

Engineers are prominent within the transport industry, not only developing the vehicles themselves (e.g. cars, trains and planes) but also the infrastructure that allows them to run (e.g. railway engineers and air traffic controllers). Example job title includes Aerospace Engineer or CAD technician.

Management and business

Project management staff oversee workers, budgets and resources to ensure projects are delivered on time and on budget. Operations management aims for production to be as efficient and profitable as possible e.g. processes are in place to ensure equipment is working and that stock and resources are monitored to ensure minimum waste and maximum output. Example Job title: Project Manager.

Regulatory affairs

Consists of quality assurance, where the quality of products are monitored to prevent defects, test engineers design and conduct testing within manufacturing to ensure products meet

company specifications and Health and Safety/Inspection engineers focus on ensuring equipment and processes function according to regulations.

Technical sales, procurement and IT

Sales engineers provide technical sales advice and support for company products, while engineers in procurement purchase goods and/or services from external organisations considering cost, quantity, quality and location. Example job titles include: Network Engineer or Technical Sales Engineer.

Typical employers

Although vacancies in electronic and electrical engineering can be found throughout the UK and internationally, many will be outside of London – especially in business parks which are often located outside cities.

Start-ups

The opportunities that are based in London will tend to be in start-ups (new businesses in the early stage of operating). Often programming skills such as C++ are required, as being a small business, they recruit multi-skilled staff who can take on a variety of tasks.

Public Sector

As well as working for commercial organisations, opportunities also exist within the public sector, typically working for the national and local government or the armed forces or defence. Keep in mind that for roles in defence such as Ministry of Defence (MoD) and the Defence Engineering and Science Group (DESG) you will need to check your eligibility regarding nationality requirements for security clearance.

Engineers in the civil service provide expertise for technical policy formulation or implementation for example, 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. Take a look at our Getting into IT guide to find out more.

Third Sector

Engineers can also work in the “third sector” (charities and non-governmental organisations e.g. [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](#) and [What can I do with my degree? - Electrical and Electronics Engineering](#).

Getting Industry Ready

In this section, we will talk about the kinds of skills and experiences employers might be looking for within this industry, and how you can go about gaining them yourself. What employers are looking for will vary depending on the role, but below 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

A postgraduate qualification is not usually essential for entry into an engineering or manufacturing job, but it can speed progress to the next level. For certain roles, it is mandatory for employees to obtain professional accreditation or qualifications. See the relevant professional body for information on qualifications required, and lists of accredited courses. Read job adverts and person specifications for the roles you are looking to apply for in the future to identify exactly what level and type of qualification they require. Employers often encourage professional development, and some may cover tuition fees and grant study leave.

Skills

Here are some key skills many employers within this sector are looking for when hiring graduates. As was mentioned before, 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 for that particular role.

“Soft” skills such as communication, creativity, and commercial awareness are just as important as technical expertise. These are often developed through work experience and involvement in projects/group work. Finding opportunities to develop and practise these skills, and explaining them on your CV/application, shows employers that you can work alongside colleagues smoothly and effectively in a variety of social and professional situations.

Technical skills

Requirements will vary according to the role, but could be a programming language (commonly Java Script, C++ and CSS) or particular software. This knowledge can be gained from your degree, work experience and own study, and due to the fast-paced nature of technological change in this industry will need continuous updating to stay current.

Effective communication skills

Required to draft reports, give technical instructions, share ideas and make presentations. Listening skills are just as essential, to hear what colleagues and clients need to understand the brief and achieve results.

Analytical & problem-solving skills

Engineers consider various ways of approaching and resolving problems in order 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.

Planning and organisational skills

Projects require thorough planning and prioritisation to ensure deadlines are met. Understanding the scope of a project and how individual elements operate as part of the overall scheme is crucial.

Team working, management and leadership

Engineering often involves working in large teams with different backgrounds and skillsets, including non-engineers, so teamwork is essential. Engineers who are also project managers must know how to build a team, taking into account ideas of 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.

Skills and Employability Week

Participate in Sci & Eng Skills & Employability Week. If you are a student in one of the schools belonging to the faculty of Science & Engineering, Week 7 across both semester's is a week of employability skills workshops all designed to equip you with the skillset needed to be successful in the recruitment & selection process, from building your knowledge of employers in industries that interest you, to mock interviews and assessment centres.

Commercial awareness

Keeping up to date with technological advances is vital in order to demonstrate your interest and enthusiasm to employers. Understanding business and economic matters, as well as the impact of engineering on society and the environment, will provide engineers with a 'bigger picture' view and an ability to make informed decisions. Take a look at our [Commercial Awareness](#) resources to find out more.

Areas in high demand

- Renewable Energy
- Electric Vehicles
- Automation & Robotics
- Power System
- Cybersecurity
- Aerospace
- Control Systems Engineering
- Embedded System
- AI & Machine Learning

Roles in high demand

- Electrical Technical
- Electrician
- Aerospace Engineer
- Test Engineer
- Computer Engineer
- Electrical Supervisor
- Control Systems Engineer
- Software Engineer
- Electrical Project Manager
- Power Electronics Engineer

Skills in demand

- PLC Programming
- Project Management
- Cybersecurity
- Data Analysis
- Interpretation
- AI & Machine Learning
- Control Systems Design
- Power Systems Engineer
- Embedded Systems Design

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!

Create an online portfolio

An online portfolio is a great way to show off the work you have created. These can be projects that you have worked on as part of your course, or even projects you have worked on yourself in your own time. An example of a personal project could be creating a website, building an app or developing a robot.

Join a society

There are a number of relevant societies at Queen Mary that will allow you to develop skills and your professional network. E.g. [AI & Robotics Society](#), [Coding Society](#), [Fintech Society](#), [Formula Student Society](#), [MedTech Society](#), [Technology Society](#), [Video and Cards Gaming Society](#).

Events/competitions

Attend 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 ([BCS](#) or [IET](#) are good places to look for opportunities). Hackathons and competitions are also great to get involved with. They look great on your CV, and allow you to develop valuable skills and experience (maybe even a prize!).

Follow organisations online

Use social media to stay up to date with industry news, build commercial awareness and develop your network. If you find a start-up that interests you, why not reach out and ask if you can intern with them?

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.

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 to opportunities.

Appointments

We run one-to-one appointments with expert career consultants who can talk to you about a variety of topics including your CV and applications, as well as give you career guidance and advice surrounding making career decisions. You can also book [Practice Interview appointments](#) to test your skills, for when you have an upcoming interview

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, Careers & Enterpriser is home to the [Aspire Programme](#): Queen Mary's Student Career Development Programme. These programmes take place alongside your degree, allowing you to gain vital employability skills to add to your CV, as well as raise your commercial awareness. Please note: Eligibility requirements apply.

Online Resources

Our bank of [online resources](#) is a great place to go for careers support. We have guides (such as this one), templates for things like CVs and applications, as well as tools that you can use to build or improve a CV ([QM CareerSet](#)), practice for a psychometric test ([Graduates First](#)) or practice for a video interview ([ShortlistMe](#)).

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.

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

Finding Opportunities

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 industries and 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. As well as looking at tech first year internships, you could also consider business and finance internships, especially if you are interested in the industry.

Although you may see yourself working in a large company, the greatest number of jobs are actually in small and medium-sized companies. Smaller organisations are often more flexible with their recruitment and are more likely to consider work experience positions.

Industrial placements

The School of Electronic Engineering and Computer 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 Industrial Placement Manager in EECS and see their [Degrees with Industrial Experience](#) page.

Plan from your first year

Most large engineering businesses advertise placements a year in advance. It is important to plan ahead 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 with evidence of career commitment and work experience. 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.

Job boards and employer sites

Once you have found vacancy websites you like, add them to your favourites and check them regularly for updates. NB: Be aware when searching online that job titles may differ for similar job roles; additionally remember the same job titles can be used for very different roles, so read the job description and person specification for fuller information.

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 and Institution of Electrical and Electronics Engineers.

Some resources are only available to members, but often reduced student rates are available. Information about courses, training and news is also usually 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.

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.

Most professional bodies and trade associations have online directories of companies that you could send speculative applications to. Also, keep in mind 'spin-out' companies (normally a company that has developed out of a university or a research project) which are likely to have opportunities that are not advertised, but found through networking and speculative applications.

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. 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 (like the Queen Mary Alumni page). LinkedIn can be a useful tool in finding opportunities.

Resources

Exploring Your Options

[The Institute of Electrical and Electronic Engineers \(IEE\)](#)

Job listing site with links to the main site that contains industry information and news.

[Institution of Engineering and Technology \(IET\)](#)

Provides news, publications, grants, networking opportunities and advice on how to find work experience. See also [separate jobs](#).

[British Computer Society \(BCS\)](#)

Excellent jobs board, news and resources plus undergraduate research bursaries (apply via School).

[Defence Security Group](#)

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

[Institute of Energy](#)

Careers information plus searchable [members directory](#) to find potential employers.

[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.

Finding Opportunities

[Just Engineers](#)

UK and Worldwide jobs. Browse jobs by sector or location.

[Fish4jobs \(previously The Career Engineer\)](#)

Vacancies in a range of industries with a range of graduate jobs available.

[Computer Weekly](#)

IT jobs plus industry specific and technology specific news.

[CW jobs](#)

IT jobs plus careers advice.

[IT Jobs Watch](#)

IT jobs plus information on trends such as salary, popular job areas and particular skills demanded by employers.

[Techno Jobs](#)

A range of IT and technical jobs.

[Contractor UK](#)

IT contracting website with vacancies, information on setting up and working as a contractor and a forum.

[NHS Careers](#)

Job profiles, training programmes and job listings for medical technology and bioinformatics roles.

[Jobs.ac.uk](#)

Academic, research and support positions in all fields.