Engineering

Engineering and skilled engineers make a significant contribution to UK productivity as well as working towards mitigating the grand global challenges of climate change, food security, clean water and energy, artificial intelligence and robotics.

The engineering sector contributes 26% of GDP to the UK economy which is more than the retail, wholesale, financial and insurance sectors combined, with 5.7 million people employed in the sector across over 600,000 engineering companies.

These companies are projected to have 265,000 annual job openings between now and 2024, and there is currently a shortage of qualified engineers graduating in the country.

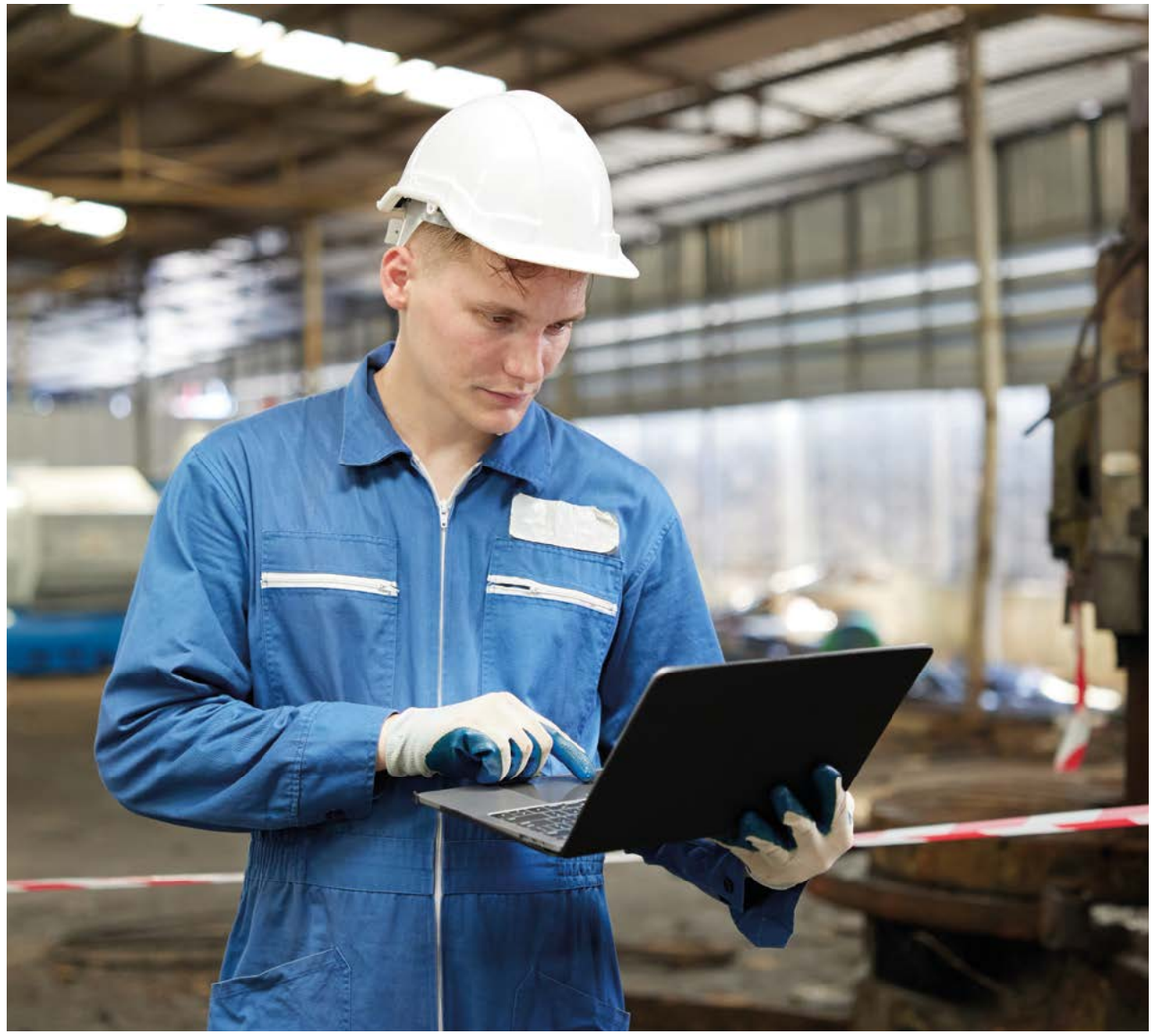
The engineering sector includes a wide range of organisations. This includes vast, multinational corporations right down to small, independent engineering companies and start-ups; for example, 58% of engineers are in SMEs with fewer than 250 employees. Some of the biggest recruiters of Oxford engineers are Arup, Atkins, Mott MacDonald, Rolls-Royce, BAE Systems and Jaguar Land Rover.

Getting in and entry points

For technical engineering roles, a degree in engineering (or sometimes a related subject, such as physics, materials science or mathematics) is usually required, and the average graduate starting salary is around £30.5k. Non-engineering roles in these firms tend to offer similar starting salaries to their competitors in other corporate sectors. Roles are offered year-round, but many of the larger graduate schemes have deadlines closing each year around December/January.

Work experience is important, and it is worth bearing in mind that the Engineering Science course at Oxford is unusual in not having a built-in period of six or twelve

www.careers.ox.ac.uk Sector Briefings: Engineering



months spent in industry. However, larger firms (many of which will attend the Science, Engineering & Technology Fair in Michaelmas term) often offer internships that will fit into a long vacation. Smaller organisations are often willing to offer work experience or internships – check on CareerConnect or contact particular firms speculatively to enquire. Internship opportunities are usually advertised a little later than graduate jobs, with deadlines tending to fall from December to February.

Extra-curricular ideas

- Join Oxford's Engineering Society, Biomedical Engineering Society or OxWEST (for women).
- Join UKSEDS (UK Students for the Exploration and Development of Space).

- Volunteer with Engineers Without Borders during your vacations to build your skills and take part in development projects. A branch has recently been started at the University.
- Take part in Oxford University Racing, run by the Institution of Mechanical Engineers, to find the best race car. See oxforduniracing.com
- Read, and write a guest post for, *Developing Engineers*, a blog written by young engineers.
- Share your passion for engineering with schoolchildren to also showcase your enthusiasm to future employers. There are a number of outreach programmes organised by professional bodies and the UK government, such as STEMNET.
- Join a professional engineering body as a young member – or represent students on their board.
- Enter the Institution of Civil Engineers' Communications Competition.

> More than 40% of UK electricity is from renewable sources. Energy consumption in the UK peaked in 2005 and is now down to 1994 levels due to energy efficiency. We need Oxford engineers to drive us towards a sustainable future.
>
> *Dr Mike Moss, Career Adviser, The Careers Service, University of Oxford*

Next steps

www.careers.ox.ac.uk/engineering
www.engineeringuk.com/media/196594/engineering-uk-report-2020.pdf

www.careers.ox.ac.uk Sector Briefings: Engineering

Alumni profile

Dr Olayinka Oduwole

What: I work within the mobile private network group at Vodafone, a group responsible for designing a dedicated private network which provides connectivity to enterprises. When I initially joined the group, I worked specifically on the integration of applications which ran over the top of the mobile private network, to provide enterprises with voice applications, and other safety applications, which kept their workers safe whilst working in hazardous conditions. My average week varies, depending on the nature of the project allocated to me and could include stakeholders' management, customer and market onboarding, product development, documentation etc.

Why: I pursued a doctorate degree in Engineering Science with a focus on solving real world challenges and hopefully translate the research into a solution with real impact on people's lives. The same goal is evident in my current career choice today, which sees me contribute towards the development of connectivity or solution products for enterprises, with real world challenges a key motivator for my career choice.

A key difference between developing a research solution and product development within my current role is that there is a short time span for the development of a solution for a customer. Typically, in my current role, we aim for a minimum viable product (MVP) whereas in research, you spend a long time attempting to develop a ground-breaking solution. Another key difference is that within my current role, there is a huge emphasis on the customers first; in fact, you begin the product design process with the customer in mind. In research, the emphasis is usually on the research results and publications.

Advice: My role is challenging and allows me continually to develop new skills. I work on a wide range of projects which constantly pushes my boundaries. Furthermore, the technology landscape is dynamic and requires the development of new skills to stay relevant. My advice is to pick a job you enjoy so when it becomes challenging, you can find the strength to overcome the challenges.

Position

Product Architect, Vodafone.

Background

DPhil Engineering Science, Kellogg College, 2016.

Alumni profile

Dr Maria Lorena Richiusa

What: My work supports the mission of delivering commercial fusion power plants for electricity production. Fusion energy has potential to be a safe, low-carbon and sustainable part of the world's future energy supply. I started working at the UK Atomic Energy Authority (UKAEA) on the Joint European Torus, the first experimental fusion machine, then moved to the design of components for the EU-DEMO, the European future commercial fusion power plant.

I am currently leading the design of plasma-facing components for EU-DEMO, i.e. limiters, which are designed to protect the machine from energy release during disruptive events. As part of an international collaboration involving UKAEA and the EUROfusion consortium, I work with a team of experts supporting the design and assessment of limiters under extreme loading conditions, by means of both analyses and experiments.

Why: I have always wanted to become a nuclear engineer, as I am passionate about the mechanisms leading to nuclear energy release – both fusion and fission – which I believe can provide the clean and renewable solution fulfilling our needs of net-zero carbon emission, baseload, and energy security. I am stimulated by new technical challenges, and the international environment around fusion research, which requires a global effort.

Working with different people gives me new ideas to drive my research. I began this work before embarking on my DPhil, and my professional knowledge helped me shape my research project. I am excited to think that, maybe one day, my skills could contribute towards steering national fusion research programmes.

Early career: Take the time to understand what you enjoy doing most. This helps keep your curiosity and personal motivation up. Research is not only discovering new things, but also recognizing similarities across multiple fields and models: it is a matter of adapting the equations.

Position

Senior Researcher, UK Atomic Energy Authority.

Background

DPhil Engineering Science, St Catherine's College, 2019.