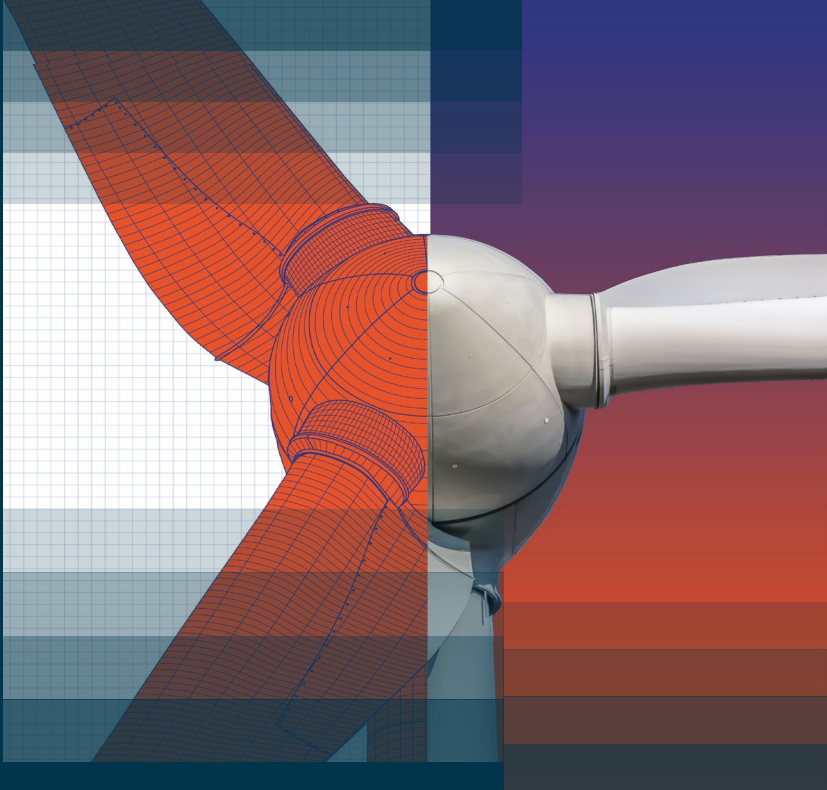




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GO BEYOND BOUNDARIES



# School of Engineering

UNDERGRADUATE GUIDE



→ **1ST IN SCOTLAND  
FOR GENERAL  
ENGINEERING**

Complete University Guide 2024

# Welcome

From the moment you join our vibrant and friendly community we are committed to ensuring that your experience is excellent. We take pride in the diversity and quality of our teaching and research, which are world renowned.

You are part of a team that has access to state of the art facilities to underpin the teaching environment and to develop future techniques and approaches in practical applications and research. We offer a suite of undergraduate programmes that reflect your study aspirations and needs, within a framework of flexibility.

Our exciting curriculum enables the development of transferable skills, which explains why University of Aberdeen graduates have some of the highest UK statistics in employability. There has never been a better time to study engineering. We are moving to some very exciting new industries and innovations all of which involve each discipline in engineering.

I hope you find the content of this booklet useful in demonstrating what it's like to study Engineering here and the skills you will develop to help you in your future career.

**Professor Ekaterina Pavlovskiaia**

Head of School

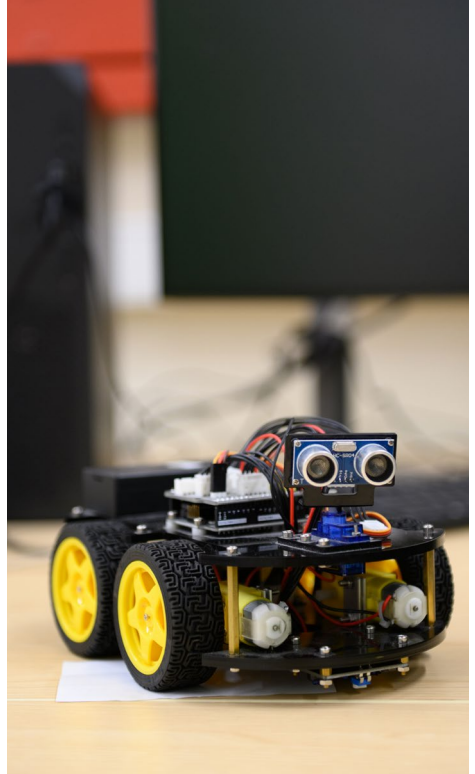


# Why Study Engineering?

Engineering is a broad subject, covering many different types of activities across various fields of human endeavour. While engineers work in many different industries, from aerospace to software, from automotive to telecommunications, from finance to pharmaceuticals and from medicine to oil and gas, all engineers use creativity to design solutions to the problems we face in the world today.

Engineering is one of the most satisfying professions. You get results and, at the end of the day, you have the job satisfaction of being able to see your work in action.

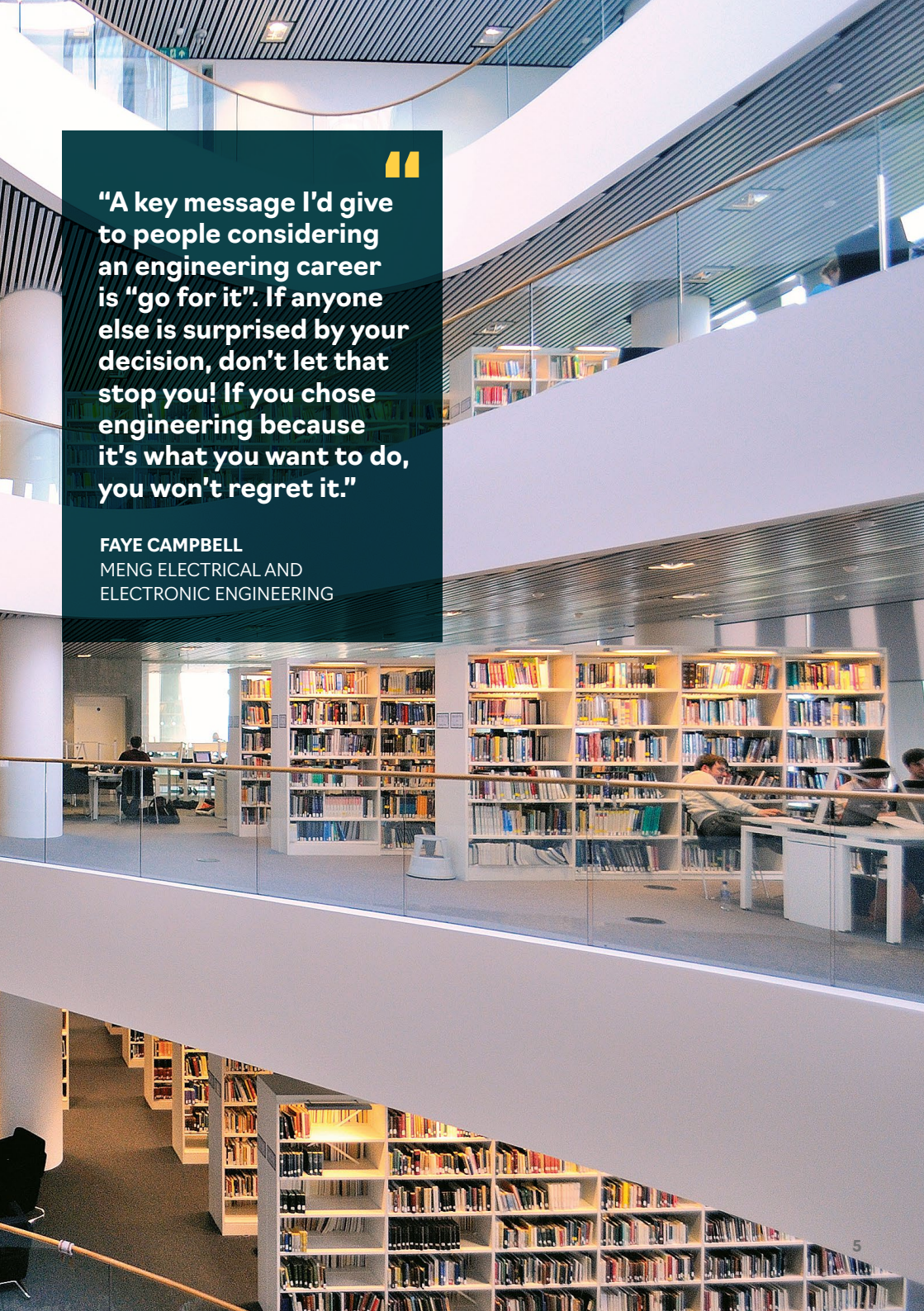
Engineering is an intellectually demanding profession, mainly because of the wide range of skills you need to deploy. You are expected to be good at mathematics, to have a sound grasp of basic sciences, to be inventive and creative, to be able to sell your ideas to clients and colleagues and, in due course, to organise and lead fellow professionals.



**“Scientists study  
the world as it is,  
engineers create the  
world that never has  
been”**

**THEODORE VON KÁRMÁN**





“A key message I'd give to people considering an engineering career is “go for it”. If anyone else is surprised by your decision, don't let that stop you! If you chose engineering because it's what you want to do, you won't regret it.”

**FAYE CAMPBELL**  
MENG ELECTRICAL AND  
ELECTRONIC ENGINEERING

# Your Learning Experience

## Interdisciplinary Engineering

The School of Engineering follows an interdisciplinary engineering model, which means all engineering students study the basic underpinning concepts and fundamentals of engineering during their first two years before specialising in one of the five disciplines in Year 3.

- Chemical Engineering
- Civil Engineering
- Electrical and Electronic Engineering
- Mechanical Engineering
- Petroleum Engineering

There are several benefits to the Interdisciplinary engineering approach. Firstly, students can use the first two years of their degree to make an informed decision about what area of engineering to specialise in, while studying the fundamental elements of Chemical, Civil, Electrical/Electronic, Mechanical and Petroleum.



**Dr Euan Bain**  
Director of Education

Year 1
Interdisciplinary Engineering (Pre Honours)
Year 2
Interdisciplinary Engineering (Pre Honours)
Year 3 (MEng and BEng)
Honours (Discipline Specialism)
Year 4 (MEng and BEng)
Honours (Discipline Specialism)
Year 5 (MEng)
Honours (Discipline Specialism)

Secondly, students benefit from a broad-based engineering education and develop the wider range of expertise and skills that are in demand from employers today.

Thirdly, the broader expertise gained through the Interdisciplinary engineering approach is particularly useful later in your career, when leading teams of engineers from across different specialisms.



**Prof Ana Ivanovic**  
Director of Student Recruitment and Internationalisation



## **MEng and BEng**

After the first two years, you have the opportunity to pursue the 5 year Masters of Engineering (MEng) or 4 year Bachelor of Engineering (BEng) degree in your chosen discipline. Our 4-year BEng programmes are accredited as fully meeting the educational requirements for IEng and partially meeting the educational requirements for CEng

Design is a critical component of all our degrees and will feature throughout. The design exercises in years 3, 4 and 5 will use that knowledge to allow you to work on real-life projects that are highly relevant to today's industry.

## **Optional Courses**

Students also choose optional courses alongside their core engineering courses. Optional courses are designed to give students a greater breadth of learning and to improve employability by further developing your other skills and knowledge. For example, you can choose courses in Languages, Mathematics, Sciences, Computing, Social Sciences, Management, Arts and Music, subject to normal timetabling restrictions.

## **Lectures and Laboratories**

Each Engineering programme is taught through a combination of lectures, tutorials and laboratory (lab) classes. Lectures are held in lecture halls and are quite different from the kind of classes you will be used to from school. In addition, you will attend labs where you will conduct experiments and receive practical demonstrations of what you have learned in your lectures. Tutorials are run as small classes where students work on example problems with support from their tutors.

## **Work Experience**

Engineering Work Experience is a new 15 credit 2nd year course designed by the School of Engineering in partnership with the University's Careers Service to develop students' work readiness. The course embeds careers education in the academic curriculum and provides students with a work-related learning experience through employer-hosted consultancy-style projects.

## **Field Trips**

Engineering students also benefit from the University's location in Energy Capital of Europe through numerous field trips and site visits to local companies. Field trips are especially valuable as they allow students to observe how the theory learned in lectures is applied in industry and also because you can learn more about different engineering careers from the industry professionals that you meet.

## **Personal Tutors**

Each student is allocated a Personal Tutor in first year. Your tutor will meet with you several times throughout each year of study, either individually, or in groups. The role of the tutor is to provide pastoral support, to help ensure that you gain as much as you can from your time at university and to guide you towards other support services when necessary.

# Discipline Leaders



**Dr Marcus Campbell Bannerman**  
Chemical Engineering



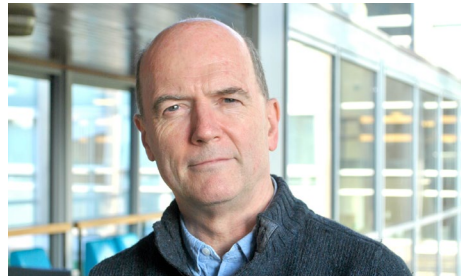
**Dr Fabio Verdicchio**  
Electrical and Electronic Engineering



**Dr Peter Dunning**  
Mechanical Engineering



**Dr Hossein Hamidi**  
Mechanical Engineering



**Dr Paul Davidson**  
Civil Engineering



# Degree programmes

The School of Engineering offers a suite of MEng/BEng programmes across the five engineering disciplines. Our Interdisciplinary Engineering approach ensures that our programmes are flexible, giving you knowledge and skills in your first two years that will allow you to specialise from your third year.

## Chemical Engineering

Need to design a process to make a new product? Need to make your existing process more energy efficient? Need to analyse if your existing process can increase production or find out where the bottleneck in your process is? Need all of this done whilst considering economics, environmental impact and safety? You need a chemical engineer!

Chemical engineers are sought after across a broad spectrum of industries. Bioenergy to beer, catalysis to clothing, chemicals to consumer goods, education to energy, finance to fermentation, foods to fuels, management to mining, oil to ore, paper to pharmaceuticals, waste to water; chemical engineers are everywhere and have an impact on most of the things we use and do.

By studying chemical engineering with us you'll learn from a team of engineers with wide-ranging interest and expertise and have contact with both academics and practicing engineers. You'll be able to interact with industry from the moment you begin your degree. You'll benefit from our newly refurbished chemical engineering teaching and research laboratories and have access to industry-standard software. Come here to study chemical engineering, go anywhere!

- MEng Chemical Engineering (5 years)
- BEng Chemical Engineering (4 years)



## Civil Engineering

Civil engineering is all about our environment. Civil engineers design, build and maintain our roads, railways, airports, dams, hospitals, schools and sports stadiums. They also design water supply systems and flood protection schemes. They keep our infrastructure working effectively and adapt it to meet challenges like population growth or climate change.

Our teaching is supported by our excellent workshop and laboratories, with state-of-the-art equipment, including some of Scotland's very best hydraulic equipment.

Choose Civil Engineering to make a lasting, positive improvement to society through sustainable design and the protection of the natural environment on land or at sea. Come here to study Civil Engineering, go anywhere!

- MEng Civil Engineering (5 years)
- MEng Civil Engineering with Subsea Technology (5 years)
- MEng Civil and Environmental Engineering (5 years)
- MEng Civil and Structural Engineering (5 years)
- MEng Civil Engineering with Management (5 years)
- BEng Civil Engineering (4 years)
- BEng Civil and Environmental Engineering (4 years)
- BEng Civil and Structural Engineering (4 years)



## Electrical and Electronic Engineering

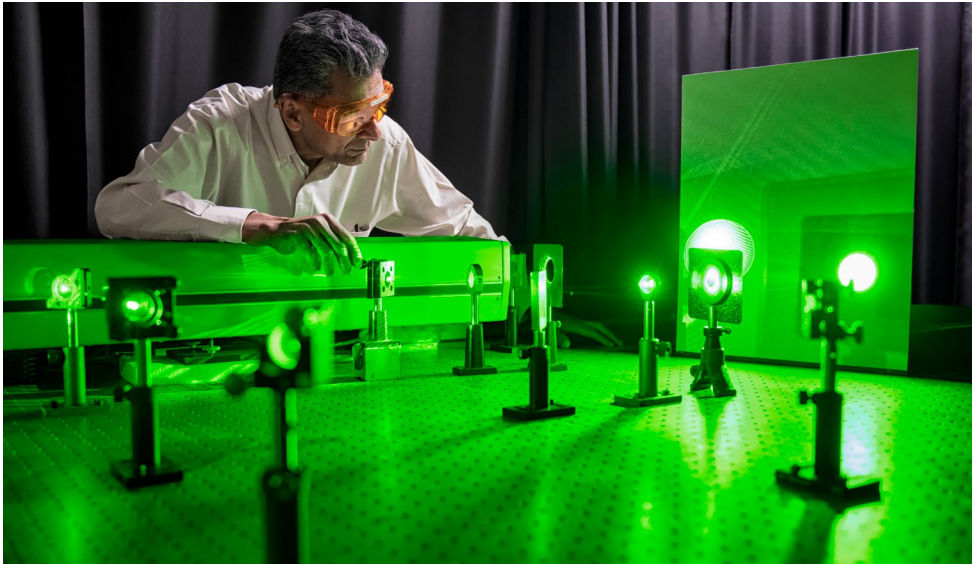
We rely on electrical and electronic engineers for almost everything we do – from small electrical devices to high voltage electrical power generation systems.

You will get to use your imagination, creativity and knowledge to supply and improve upon the complex systems needed by today's society. You might design machines that supply power to our homes, digital control systems for aircraft or put an entire computer system on a single silicon chip. Electrical and electronic engineers will be vital to future technologies such as driverless vehicles, robotics, medical equipment and the next generation of mobile data transmission.

We have labs dedicated to satellite communications, lasers and computer-aided design, as well as many others.

Choose Electrical and Electronic Engineering to understand and develop the key technologies we now take for granted in our everyday lives. Come here to study Electrical and Electronic Engineering, go anywhere!

- MEng Electrical and Electronic Engineering (5 years)
- MEng Electrical and Electronic with Renewable Energy (5 years)
- MEng Electronic and Software Engineering (5 years)
- MEng Electrical and Electronic Engineering with Robotics (5 years)
- BEng Electrical and Electronic Engineering (4 years)
- BEng Electronic and Software Engineering (4 years)



## Mechanical Engineering

Virtually every product in modern life has, at some point, had input from a mechanical engineer. It is not surprising, therefore, that mechanical engineering is widely regarded as one of the most diverse engineering disciplines.

Mechanical engineers develop everything that moves or has moving parts – from spacecraft to racing cars, from robotics to mechanical hearts and artificial limbs, from wind turbines to oil and gas exploration technologies.

Choose mechanical engineering if you've ever found yourself fascinated by how machines work and how the use of machinery can make previously impossible things become possible. Come here to study Mechanical Engineering, go anywhere!

- MEng Mechanical Engineering (5 years)
- MEng Mechanical and Electrical Engineering (5 years)
- MEng Mechanical Engineering with Biomechanics (5 years)
- MEng Mechanical Engineering with Management (5 years)
- MEng Mechanical Engineering with Subsea Technology (5 years)
- BEng Mechanical Engineering (4 years)
- BEng Mechanical and Electrical Engineering (4 years)
- BEng Mechanical with Oil and Gas Studies (4 years)





## Petroleum Engineering

Petroleum engineers are concerned with the design, development and promotion of front-end engineering applications and technologies required in the exploration, drilling, production and management of oil and gas reservoirs both onshore and offshore, whilst giving due consideration to health, safety and environment.

They are also involved in the design and development of technologies and processes associated with energy transition, e.g. carbon capture and storage and geothermal energy extraction. They work with geologists and other engineers to ensure safe recovery, processing, transportation, transmission, and utilisation of petroleum products often in very challenging environments.

In addition to the technical petroleum engineering skills, petroleum engineers learn and develop skills in project management, project economics and environmental impact assessment. It is not surprising therefore that

petroleum engineers are highly sought after by major energy and non-energy companies around the world, and are amongst the best paid compared to other engineering disciplines.

Aberdeen is based in the heart of the North Sea energy industry and is an International Centre of

Excellence for exploration and production of oil and gas.

Choose Petroleum Engineering at the University of Aberdeen to draw upon our well-established expertise in engineering aspects of exploration and exploitation of hydrocarbon to meet the industry challenges of the future. Come here to study Petroleum Engineering, go anywhere!

- MEng Petroleum Engineering (5 years)
- BEng Petroleum Engineering (4 years)



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**Aberdeen Engineering and Technology graduates earn £17,679 per year more than the sector average five years after graduation**

**(UK Department of Education, 2018)**



**David Grant,  
MEng Chemical Engineering**

**Why did you choose this degree programme at the University of Aberdeen?**

As long as I can remember I have been interested in how things are produced, ranging from a bottle of wine, through medication, to electricity. From there it was a small step to discover how on earth all these were produced in huge scales required by people. After some researching on the internet, I discovered that at the very heart of nearly everything produced and consumed was a team of chemical engineers. Some more in depth reading and I was convinced that chemical engineering was the degree I wanted to pursue.

When applying for university positions, Aberdeen stood out as it offered more than just a chemical engineering degree. The first 2 years encompass all aspects of engineering, which wasn't offered at the other universities I was considering. At first glance, it may seem strange that you are covering different engineering disciplines, however no engineering problem focuses solely on a single discipline. With this approach, University of Aberdeen offered the chance to develop myself as an all-round engineer with insights into each discipline, while still achieving a fully accredited chemical engineering degree. This made my choice to study at the University of Aberdeen an easy one.

**What skills, knowledge or experience have you gained or developed on this degree programme?**

Studying engineering at the University of Aberdeen develops more than just the skills required to complete a calculation. Soft skills such as teamwork, organisation and time management are taught from the minute your degree starts, thanks to excellently designed courses and facilities that allow you to make the best use of individual and group work.

I have gained skills in computer programming in languages such as MATLAB, Python and C++, 3D modelling and printing, and printed circuit board design (PCBs). Currently I am also developing skills in acoustic levitation to complete another project that I am undertaking.





**Chiara Ferdynus,  
MEng Electrical and Electronics  
Engineering**



**Why did you choose this degree programme at the University of Aberdeen?**

I only decided to study Electrical Engineering halfway through my second year at university. Like most high school students, I did not know exactly what I wanted to study. I really enjoyed maths, physics and problem solving but didn't know which engineering discipline would suit me best. That is why Interdisciplinary Engineering seemed like the optimal choice as it gave me a chance to explore multiple degree programs and make a decision based on my experience.

**Have you undertaken a work placement or internship during your degree?**

I worked as an Electrical Engineering intern in the instrumentation and controls team at BP. What was exciting is that I had my own projects, one of them being the development of a catalogue for subsea electrical equipment for which I closely worked with suppliers, getting an insight into other companies as well.

The internship certainly opened my eyes and changed my perspective on electrical engineering in a positive way, fuelling my interest and making me excited to graduate and work in the field! The switch from academia was refreshing and gave me a new perspective on how to think and what questions to ask.





**Umama Bendaoud,  
BEng Chemical Engineering**



**What skills, knowledge or experience have you gained or developed on this degree programme?**

A Chemical Engineering degree allows students to learn a multitude of skills that are highly sought in industry. The most important skills that I have developed throughout my degree are problem solving, time management, the ability to learn complex software and program in a very short period of time and the ability to work as part of a team.

**What part of the degree programme have you enjoyed the most or found most interesting?programme?**

The professors at the university of Aberdeen have made my degree not

only enjoyable but full of support and opportunities. The lecturers in the School of Engineering in particular are not only knowledgeable people but individuals who really value and care about their students' wellbeing and development. I would also like to highlight the various opportunities that the University of Aberdeen offers such as summer projects and extracurricular activities.

**Have you undertaken a work placement or internship during your degree?**

Last summer, I have managed to secure an internship with Centrica PLC as a commercial analyst. I was responsible to analyse the viability of using green hydrogen as alternative fuel in UK. The position helped me to acknowledge the importance of commercial awareness in a technical/engineering role.



**Simon Allen,**  
**MEng Mechanical Engineering**

**Why did you choose this degree programme at the University of Aberdeen?**

I originally applied to the MEng General Engineering programme as the University of Aberdeen was one of the only Universities in Scotland to offer a completely generalised first two years for an undergraduate engineering masters. After my second year, I chose the Mechanical Engineering programme as I am more interested in systems with moving components than the more statics based Civil Engineering. I had no real modelling or programming experience before starting my degree, however these skills have been developed throughout my time at University. This includes working with software such as MATLAB, Ansys, Abaqus CAE, Solidworks and Wolfram Mathematica, among others. There has been group work involved in every year of my degree which has allowed me to continually develop my teamworking skills across a variety of tasks.

**What part of the degree programme have you enjoyed the most or found most interesting?**

Both my individual Master's project and my Master's group project have been the most fulfilling aspects of my degree. It has allowed me to combine and apply a number of topics and skills I have developed throughout my degree into one substantial piece of work. This applied aspect of the work was a good way of showing myself how the topics can seem separate while studying them however, when applied are really interconnected.

The opportunity to go to NESCOL (North East Scotland College) for six sessions in 2nd year to learn new skills such as arc welding, surveying and soldering were a nice change of pace from the usual University routine. This chance to get hands-on experience definitely contributed to my overall education within my degree.

# Clubs and Societies

As a University of Aberdeen student, you can join any number of clubs and societies depending on your hobbies or interests.

There are a number of societies directly related to engineering, where you can meet fellow engineering students and develop your interests and new skills, including:

- Chemical Engineering Society
- Energy Society
- Civil Engineering Society
- Electrical & Electronic Engineering Society
- Engineering Society
- Engineers without Borders
- Society of Petroleum Engineers
- TAU Racing Society
- Aberdeen University Women in Science and Engineering (AUWISE)
- Robogals
- ProtoTAU
- Aerospace Engineering Society

[www.ausa.org.uk/](http://www.ausa.org.uk/)



# Student Teams

## TAU Racing

Every year, Team Aberdeen University Racing (TAU Racing) design, develop, build and market a single seat race car to compete in Formula Student, an international race organised by the Institution of Mechanical Engineers (IMechE) held at Silverstone, which attracts entries from universities around the world.

TAU Racing is a great opportunity for students in all disciplines to apply engineering methods learned in class to a real life engineering project, while also developing their team working, project management and communication skills.

[www.tauracing.com](http://www.tauracing.com)







## PrototAU

Team PrototAU consist of students from engineering and business, who develop and build a car to compete in the Shell Eco-Marathon (Prototype class). This competition challenges students from around the world to design, build and test energy-efficient cars, pushing the boundaries of what is technically possible. Students take their designs to the track to see which vehicle can go furthest on the least amount of fuel.

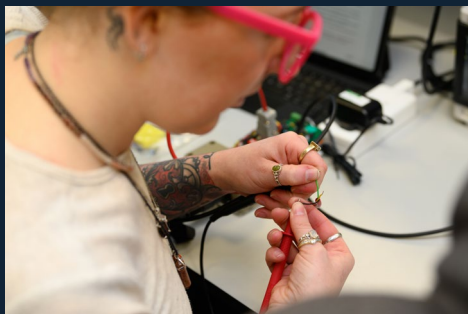
# Study abroad

Studying abroad is a great way to gain international experience while earning your degree.

The School of Engineering has a number of partnerships with leading universities through the Study Abroad and Erasmus+ scheme. We have a one year international exchange available in the second year, as well as the opportunity to do your individual project abroad in your fourth year for all disciplines (excluding Electrical and Electronic Engineering).

Study a semester at a trusted partner university in Europe, the USA, Singapore, Hong Kong and elsewhere. You'll earn credits toward your University of Aberdeen degree and get to experience living in another country.

[abdn.ac.uk/go-abroad](http://abdn.ac.uk/go-abroad)



# Careers and employability

One of the great advantages of having a degree from the University of Aberdeen is that it provides you with a broad range of skills to offer future employers.

Our dedicated Careers Service exists to give you everything you need for future employment. Beginning with a one-to-one appointment with one of our Careers Officers, you will benefit from a range of resources, including our careers library, mentoring scheme, online professional skills courses, the Leadership Academy and a range of on-campus events led by industry, including fairs, workshops and presentations.

Within the School you will also have numerous opportunities to engage with employers and our optional work placement module will allow you to gain first-hand industrial experience as part of your degree.

All Engineering undergraduate degrees are accredited by at least one major professional engineering institution, giving you your first step to achieving Chartered Engineer status. Being a Chartered Engineer can lead to improved career prospects, higher earning potential and an international recognition of your skills.

More than 85% of Engineering graduates were either in employment or undertaking further study within six months, including 100% of MEng Civil Engineering students and 92.3% of MEng Mechanical Engineering students (most recent Destination of Leavers from Higher Education report, HESA 2016).

Graduates went on to work at a huge range of organisations, including Network Rail, Scottish and Southern Energy, Shell, the Ministry of Defence, ConocoPhillips, Talisman Sinopec, Cisco, Goldman Sachs, KPMG, PwC, Jaguar LandRover and BAE Systems.


→ **1ST IN SCOTLAND,  
4TH IN THE UK  
FOR GRADUATE  
SALARIES FIVE YEARS  
AFTER GRADUATION**


Department for Education Longitudinal Education Outcomes survey, 2019

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