

DEPARTMENT OF ENGINEERING GUIDE





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WELCOME TO THE DEPARTMENT OF ENGINEERING

A MESSAGE FROM OUR HEAD OF DEPARTMENT

"Our aim in the Department of Engineering is to give the best education possible, providing an encouraging, supportive and intellectually challenging environment where students can develop their skills and enhance their employability. Students are exposed to, and actively involved in, some of the cutting-edge research that goes on in the Department."

As a collegiate university, Durham has much to offer in terms of social, sporting and musical life and is a fantastic place to live as well as study.

We pride ourselves on our world leading research and links to significant industry partners. It is a very challenging and exciting time to become an Engineer and Durham University provides the perfect environment to begin this journey."

Professor Simon Hogg,
Head of the Department of Engineering and Ørsted Professor in Renewable Energy





Durham University is a world top 100 university.



Durham University Engineering is 5th in *The Complete University Guide 2018*.

ENGINEERING DEPARTMENT OVERVIEW

We have a long history and tradition of Engineering. Engineering has been taught at Durham University since 1838 making it the first course of its kind in England. We have helped to shape the past and continue to shape the future.

We have outstanding course content that equips young engineers with the problem solving skills of the 21st century. High-quality taught modules will introduce advanced Engineering topics and a substantial group design element will equip students with the ability to carry out advanced design in multinational teams using appropriate design standards and sophisticated engineering analysis tools.

EXCELLENT RESEARCH-LED TEACHING:

The Department's academic staff are all actively engaged in research at the frontiers of modern engineering analysis, design and practice. This passion and knowledge is brought into all postgraduate courses and even the undergraduate programme through design projects, the final year project and fourth year courses.

INDUSTRY LINKS AND REPUTATION WITH EMPLOYERS:

Engineering at Durham is consistently ranked amongst the very best in terms of employer reputation. We have the highest rate of employment and further study in the UK for undergraduates completing their first degree.

STUDY ABROAD:

An additional year can be taken at an overseas institution at undergraduate level. Currently, we have links with universities in Australia, Canada, Hong Kong, Singapore, Germany and France, amongst many others.

OUR ENGINEERING DEGREES ARE FULLY ACCREDITED BY:



ENGINEERING EXTRA-CURRICULAR EXPERIENCES

Durham University Electric Motorsport team (solar car team) are the longest running and most successful student lead solar car team in the UK.

Every two years they compete in Australia to race from Darwin through the middle of the country to Adelaide and have recently come back after another successful race. Any student can get involved in the practical side or sponsorship of this incredible project.

Engineers Without Borders works on finding innovative engineering solutions for application in developing countries.

Engineering Society brings together all years of Engineering students at undergraduate and postgraduate level for

socials and events to network with each other. Students from all around the world come together to have fun and often make lasting friendships.

"I have been active within the student society DUEM (Durham University Electric Motorsport), where I am the current Team Principal. We are a society that designs, builds and races solar-powered cars internationally across the globe. In 2015 and 2017 I had the opportunity to go out to Australia to race in the World Solar Challenge. This has given me the opportunity to travel and develop a lot of skills on top of my degree, such as presentation and logistical planning."

Oliver Headlam-Morley,
General Engineering student



92%

of Durham University Engineering alumni are in paid employment or further study 6 months after graduation

CAREERS AND EMPLOYABILITY

The Department of Engineering runs degree programmes that produce talented graduates with strong academic and scientific competences, aligned to the needs of industry on a local, national and global level.

The Department is amongst a small number of general engineering departments in the UK. Engineering is viewed as an integrated subject and students are given opportunities to develop a diverse technical grounding

during their degree courses. We believe this overarching understanding of engineering and how engineers work together, not only provides wider knowledge but also equips graduates to be leaders in their fields.

The Department is closely linked to many industrial partners for both teaching and research purposes, which ensures that graduates are best placed to apply their learning on entry to the working environment.



"Siemens puts great value on engagement with partner universities such as Durham University's Department of Engineering: by collaborating with the relevant faculties and university student societies, graduates receive a much more realistic view of what careers they could embark upon. Visits to Siemens, for example, show graduates how they will be able to apply their academic education in the workplace. Siemens is a proud partner of the university's employer engagement scheme."

Martin Hottass,
Energy Sector Development Partner,
Siemens Energy

"As a Durham graduate now working in the field of Human Resources for Rolls Royce, there are certain things we look for in our graduates: influence, judgement, integrity, leadership, breadth of knowledge and teamwork to name but a few. We consistently recruit high calibre graduates from Durham University who demonstrate these competencies and are a true asset to our organisation,"

Alice Taylor,
HR Business Partner at Rolls Royce,
Canada

"At Sage, we value the close ties that we have with Durham University's Department of Engineering for a number of reasons. Of course, over the years we have recruited a number of graduates from the University who have gone on to make a great contribution to the Sage business, but more than that we have developed a mutually beneficial relationship with the University which helps graduates and teaching staff to understand more about the skills and competencies we're looking for as an employer."

Mark Gamble,
Head of R&D, Sage (UKI) Central



£4.3
MILLION

has recently been spent in renovations which have significantly increased computing resources.

LABORATORIES AND PRACTICAL

The Department of Engineering features a number of dedicated teaching laboratories including the newly refurbished Electrical laboratory. Students use these facilities to gain practical experience to complement theory learned in lectures.

Durham's largest wind tunnel features a pioneering active turbulence generator system that allows gusts of wind to be created on demand to evaluate the performance of cars in real-world conditions.

Clean rooms are hi-tech facilities to enable students to do experiments in very controlled environments. The state-of-the-art laboratories allow scientists and engineers to build and measure very small devices in an environment free of contamination such as dust particles.

We have recently undergone a £4.3 million renovation that has significantly increased the computing resources available for our students and includes large memory and high-end processor machines for computationally demanding final year projects.



INDUSTRY LINKS

We have a strong focus on strategic partnerships with key industrial organisations with research interests that overlap our major research areas. Notable among these is a partnership with Ørsted (previously named DONG Energy), who have provided funding of £1M to endow a Chair in Renewable Energy.

Research in the areas of energy delivery and computational geomechanics have enabled a partnership with Ikon Science, who have part-funded a lectureship. Our staff are actively working with these organisations to develop new solutions to pressing societal and technological problems. We maintain Department relationships with other blue chip engineering companies (e.g. BAE Systems, Rolls Royce, BP) and SMEs.

The Department also benefits from an active Industrial Partnership Committee which currently has representation from approximately 20 local/national and international companies. The Committee forms a direct link between the Department and employers. Its objectives include ensuring that students are given the best possible opportunities in terms of industrial placements and graduate employment.

Field trips to factories and Engineering sites are organised throughout the year for students to engage with workplaces, learn more about career paths and understand how their studies are applied in the field.

www.durham.ac.uk/engineering/industry

"The 10-week BP summer placement was a great experience. My project was coupled systems by material point method for offshore analysis which is a cutting edge research area. It was challenging but enjoyable. Through this experience, I learned new knowledge and related theories to real world applications; I also improved various skills, like presentation and programing. But most importantly, it gave me a deep insight into research which I found quite exciting. I enjoyed solving hard problems, creating something new and the resultant satisfaction. Now, I am considering research as a career instead of going into industries."

Miss Yun Bing

"I now work as a Product Design Engineer for Cummins Generator Technologies looking after alternators ranging from 200-4250 kVA of Low, Medium & High Voltages. The University-Industry relationship is an added advantage for Durham University Students that gives them a chance to partner with a company to work on active projects. For my R&D project I had an opportunity to work with Cummins Engines, Darlington which was a great experience that led me working for Cummins after graduation."

**Mr Balakumar Sriramulu,
Graduate at Cummins**



4th

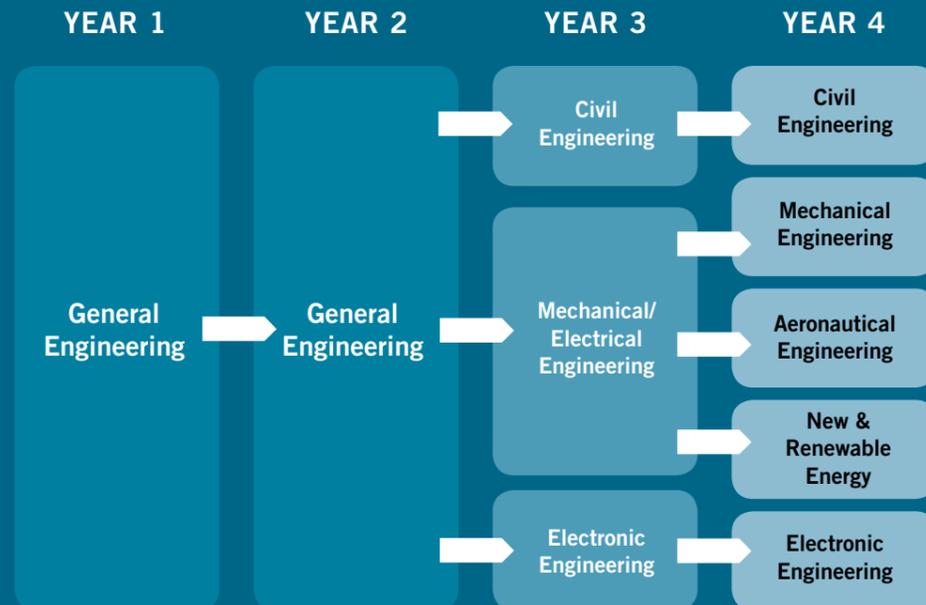
in *The Guardian*
University Guide 2018.

ENGINEERING DEGREE COURSES

At Durham University, we consider Engineering as an integrated subject rather than sub-dividing the discipline into narrow areas. As a result, our courses produce modern engineers who are capable of solving problems across the traditional engineering boundaries. This gives students a huge amount of flexibility and choice through their undergraduate degree.

UG GENERAL ENGINEERING STRUCTURE

The first two years of our undergraduate degree courses teach the essential aspects of Civil, Electronic, Electrical and Mechanical Engineering as well as the underpinning Mathematics. Students will also gain a significant amount of training in computer program development, the use of technical software and engineering design.



"Studying Engineering at Durham University was the best choice I ever made. Even though sometimes the course was demanding, the experience of being at Durham has been amazing. By having a course that is general for the first two years, it really helped me to understand exactly what I wanted to do. I know that my time at Durham has fully prepared me for whatever the future may hold in my engineering career."

Samantha Brizuela,
Graduate at Jaguar Land Rover

www.durham.ac.uk/engineering/undergraduate

POSTGRADUATE

MSc New and Renewable Energy

MSc Electronic and Electrical Engineering

MSc Advanced Mechanical Engineering – new for 2018 entry

MSc Civil Engineering – new for 2018 entry

The MEng Research and Development Project provides an open ended challenge for MEng and MSc students. The best students can make a real contribution to the state of the art modern engineering. Each student is allocated an academic supervisor and they gain access to the School's excellent experimental and computational research facilities and workshops. Most students regard their projects as the highlight of their degree.

Recent final year projects have included:

- Control of an air to air refuelling drogue
- Simulation and characterisation of a microflow sensor
- The aerodynamics of Nascar drafting
- Inkjet printing of electronic components
- Drag reduction for wind turbine blade testing
- Shrinkage and swelling of clay soils
- Butterfly aerodynamics
- Estimation of the pressure field from 2D velocity fields obtained by Particle-Image Velocimetry
- Design and construction of a miniature thermoacoustic engine

MSc by Research and PhDs

We have a rich research background which can be a huge advantage to any prospective research students in our fields of expertise. Our research challenges are inter-disciplinary and push the boundaries to gain new insights into global problems.

"When I applied to study at Durham University, I was certainly not expecting so many favourable aspects that have made my time here very enjoyable. The lectures are of very high quality, and given by experts in each subject that are more than willing to help at all times. Assignments are at times demanding but also very rewarding, since I have been able to use new software and solve real-life problems in the field of renewable energy generation and integration, as well as developing projects in the same way an engineer would."

Sebastian Sanchez Perez-Moreno,
Graduate

www.durham.ac.uk/engineering/postgraduate



JOINT
1st

in the UK for internationally excellent and world-leading research impact (REF 2014).

RESEARCH

Durham University is recognised as one of the leading centres of research in Engineering in the world. The Department's research covers a wide range of topics, which can be divided into three challenge areas: **Future Energy Systems, Next Generation Materials & Micro systems and Sustainable Infrastructure.**

FUTURE ENERGY SYSTEMS

New and Renewable Energy and Thermofluids is an increasingly popular and significant challenge globally. We are passionately researching and formulating innovative solutions to current and future energy related challenges and opportunities from both a UK and global perspective.

SUSTAINABLE INFRASTRUCTURE

We are working on challenges relating to transportation (rail and road), energy and communications networks as well as addressing water and waste systems and supporting our emergency services. A strong focus is on climate resilience, dealing with drought and flooding events, as well as climate change.

NEXT GENERATION MATERIALS AND MICROSYSTEMS

The aim of our research is to understand and exploit the electronic, physical, chemical and biological properties at the nanoscale. Our high impact work is supported by extensive cleanroom and other laboratory facilities within the department.

Our challenges are important because they encourage inter-disciplinary research and national or international co-operation.

www.durham.ac.uk/engineering/research

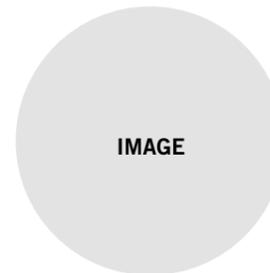


ACADEMIC STAFF AT DURHAM UNIVERSITY ENGINEERING DEPARTMENT



"My research focuses on the development on electronic nano devices which are able to convert waste heat into useful electric power."

Dr Claudio Balocco



"I use my knowledge in aerodynamics to improve the performance of turbo machinery and renewable energy devices."

Dr Grant Ingram

www.durham.ac.uk/engineering/research



RESEARCH INSTITUTES

DURHAM ENERGY INSTITUTE

The Durham Energy Institute tackles the societal aspects of energy technology development and use. This is increasingly recognised as an important aspect of energy research, which has previously been overlooked.

“Durham Energy Institute covers the spectrum of energy research but the areas in which we excel most are those which lie at the boundaries between the traditional technical disciplines and the social sciences and humanities. We encourage such interdisciplinary work as we feel these areas will yield major breakthroughs. The small size and compact nature of the university is to our advantage as it naturally stimulates interactions between departments and disciplines.”

DEI, 2018

INSTITUTE OF ADVANCED RESEARCH COMPUTING (iARC)

iARC's goal is to provide leadership and enhance Durham's capacity in advanced computing-based research, encourage novel applications of advanced computing techniques and infrastructures and foster transformative, interdisciplinary collaborations across computer science, engineering, physical and social sciences and humanities.

BIOPHYSICAL SCIENCES INSTITUTE (BSI)

Through collaborative and multidisciplinary research, the BSI works to solve major biological challenges by developing new scientific methods and technologies.

WOLFSON RESEARCH INSTITUTE FOR HEALTH AND WELLBEING

The Institute facilitates research on medicine, health, and well-being and is named after the Wolfson Foundation, which provided funds for the Institute's establishment.

CENTRE FOR COMMUNICATIONS SYSTEMS

This is an interdisciplinary centre involving academic staff from the Department of Engineering, the Department of Computing Sciences and the Department of Mathematics. Its research themes extend to all areas of wireless systems, which have infiltrated most aspects of our daily life.

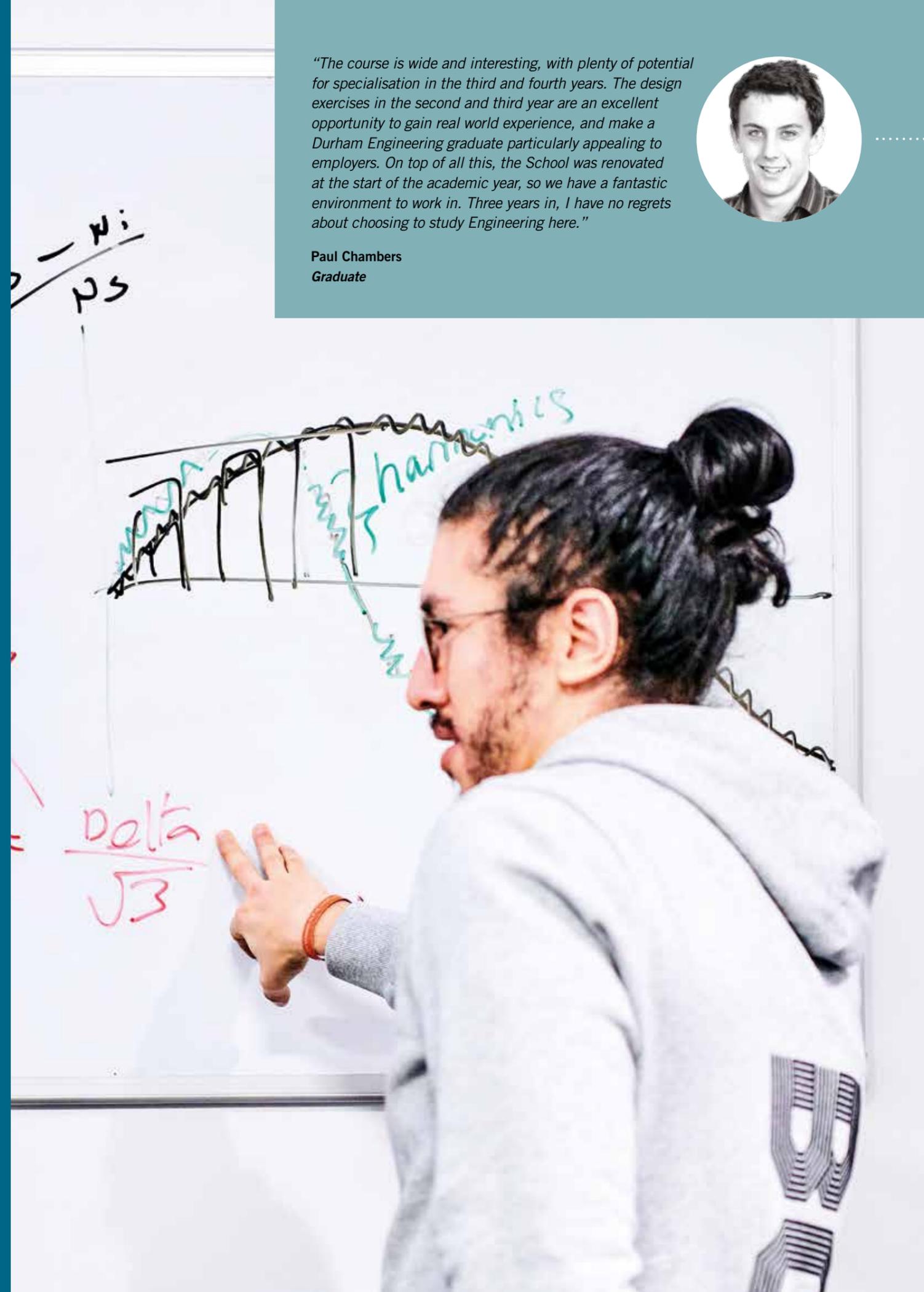
www.durham.ac.uk/engineering/research



“The course is wide and interesting, with plenty of potential for specialisation in the third and fourth years. The design exercises in the second and third year are an excellent opportunity to gain real world experience, and make a Durham Engineering graduate particularly appealing to employers. On top of all this, the School was renovated at the start of the academic year, so we have a fantastic environment to work in. Three years in, I have no regrets about choosing to study Engineering here.”



Paul Chambers
Graduate



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