Engineering
Welcome to Engineering at Lancaster

Engineering is creativity, challenge, vision, team working. Engineering is also the foundation of progress in the modern age providing 25% of turnover in the UK economy.

The Engineering Department fully embraces these great principles to offer you a unique learning experience. Our state-of-the-art building and highly qualified staff will guide you towards new technological horizons, whilst cutting-edge equipment will give you a flavour of the progress to come.

Our teaching approach delivering the scientific fundamentals across a common first year will gradually introduce you to a broad multidisciplinary background for the understanding of big technological challenges. Each year of your degree will be different, each year you will have new projects, a new challenge. You will be involved in our state-of-the-art research and industrial activities. Your supervisors will be leading experts in topical engineering disciplines. Our academic tutorial system, open door policy and practical problem focused teaching will allow you to seamlessly transform to the real world of engineering and your future career.

Professor Claudio Paoloni
Head of Department

For more information please visit lancaster.ac.uk/engineering
Outstanding facilities

The Engineering Building at Lancaster opened in March 2015 and was purpose built to represent the interdisciplinary nature of the subject and our general engineering ethos. It provides modern facilities to accompany world-class teaching and research to prepare and inspire the next generation of engineering talent.

With continued investment we are frequently expanding the facilities available. The building comprises of innovative advanced technology in a modern and attractive environment that our researchers and industrial partners can benefit from considerably.

With a number of specialist labs which brings together our research and teaching for our undergraduate programmes our students work in a variety of ways outside the traditional learning environment which enhances the quality of our student’s experience.

For more information please visit lancaster.ac.uk/engineering
Why study Engineering at Lancaster?

At Lancaster we take great pride in the Engineering education we deliver. We equip our graduates with not only the specialist knowledge and skills of their chosen engineering discipline but also in general engineering principles though our common first year. This allows students to go on to work in modern interdisciplinary settings rapidly adding value to their employer’s business right from graduation. This is borne out in our excellent graduate employability statistics.

Engineering is a lot more than just theory and at Lancaster we adhere to the principles of CDIO™ (Conceive Design Implement Operate), giving students increasingly open ended real-world engineering problems to solve. Here they get opportunity to put into practice their design, analytical skills and engineering knowledge to propose, design, build, test and validate their practical solutions. Final year projects often have genuine positive impact on local business and society through the devices/systems that are developed.

Dr Richard Dawson
Director of Undergraduate Studies

“In the everyday we provide a supportive and friendly atmosphere through the individual and small group academic tutorial systems and the easy access to academic and technical staff that our students enjoy.”

What will I do in my first year?

All academic staff are research active meaning that specialist engineering modules are delivered by experts within their field. As a department we always seek to keep ourselves current in what we offer through engaging with engineering businesses, the Engineering Institutions (such as IET, IMechE and IChemE) and by responding to student feedback and comments.

All our undergraduate degrees start with a common first year where you’ll study the following modules:

- Design, Innovation and 3-D Thinking
- Strength and Materials
- The World of Manufacture
- Transport Technology
- Energy, Technology and Sustainability
- Electrical and Electronic Fundamentals
- Fundamentals of Electronic Instrumentation
- The Digital Domain
- Chemistry for Engineers
- Process Engineering Fundamentals
- Introductory Engineering Mathematics
- Calculus
- Differential Equations
- Further Engineering Mathematics
- Computers and Control
- Sensing and Signals

Course Flexibility

If you’re unsure of which area of specialisation you’d like to go into at first, you can use UCAS code H100: Engineering on your application form and this leaves your options open.

Similarly, subject to meeting progression requirements, the common first year allows students to change their specialisation allowing a more informed choice at the end of year one.

The Engineering Department’s Part I is common to all courses and offers the students an overview of engineering science and design across the disciplines, as well as a solid grounding in mathematics. The taught components enable the students to develop a common language of engineering and equip them with the tools necessary for the remainder of their academic careers and into employment. Laboratory sessions are designed to help students develop their practical skills and, through group work, their interpersonal skills.

Dr Fabrice Andrieux
Director of Study – First Year

For more information please visit lancaster.ac.uk/engineering
Chemical Engineerings

Chemical engineers are employed across a huge variety of sectors and need technical knowledge of chemistry, biochemistry, engineering, materials science and IT as well as skills in management, safety and the environment.

Our modern chemical engineering programmes offer a common first year structure delivering fundamental engineering science and engineering mathematics to give you a sound base on which to develop your specialist. In the second year you will study modules covering reactor design, heat transfer and separation processes as well as continuing to develop your core skills as an engineer. In the third year you will, working in a group, undertake a process design project alongside learning about process safety and developing your specialist knowledge of chemical engineering.

The MEng course adds more than just a fourth year of study to the BEng programme. MEng graduates are expected to have entrepreneurial, leadership and problem solving skills along with a broader technical knowledge and deeper understanding of their subject. They are future leaders in their selected field. Individual projects, whose design is guided by our research strengths in fuel cell and electrochemical reactor design, chemical sensor development, energy and flow physics modelling and water process engineering give you the opportunity to work with cutting-edge technology, are a key feature of our programmes.

Our Chemical Engineering programmes are accredited towards Chartered Engineer (CEng) status by the Institution of Chemical Engineers.

BEng: H800
Course Length: 3 Years
MEng: H811
Course Length: 4 Years

What they say...

“As a student applying from Italy, I chose Lancaster between other universities in the UK because of the individual attention I knew I’d receive with the Chemical Engineering intake being small. The intellectual challenge, the subjects and the fluid nature of this course made it my first choice, and I couldn’t be happier.”

Luca Canal, BEng Chemical Engineering
Our three-year BEng course will help you develop a sound foundation in all aspects of Electronic and Electrical Engineering that are crucial to the design and manufacture of future systems in the medical, environmental, energy, transport, communications and ICT markets. You start your degree following core General Engineering and Engineering Mathematics subjects with specialisation in Electronic and Electrical Engineering from year 2 onwards.

The course is accredited by the Institution of Engineering and Technology and Lancaster is a University Partner within the UK Electronics Skills Foundation and associated scholarship scheme. During year three you will have the opportunity to study an individual project under one to one tuition and guidance from our staff who are leading experts in the areas of electronics design, RF and wireless technologies, sensors and instrumentation, nanotechnology and renewable energy. Examples of previous projects include glove controlled robotic hand, a VHDL/BSIDL based interface for a through life condition monitor, novel metamaterial antennas, harmonics on wind turbine to grid connections, accelerating systems for the large hadron collider.

Our MEng Electronic and Electrical Engineering degree is fully accredited by the Institution of Engineering and Technology and builds upon the BEng where you will face a higher level of technical understanding using cutting-edge technology and are expected to develop your leadership, entrepreneurial and management potential. In your fourth and final year you will undertake a major group project, often linked with industry where you will contribute your expertise and learning from the previous three years to an interdisciplinary project team. Example previous projects include digital telemetry for formula student race car, control and electrical power system design and wireless instrumentation for renewable power system, a robotic humanoid, embedded control for a novel 3D printer and high frequency structures for 5G communication. Additionally, students on the MEng will undertake two short industry-linked projects. These will provide you with more in-depth knowledge and highly-valued project management and leadership experience.

What they say...

“I initially applied to General Engineering, then after the first year found that I really enjoyed the electronics modules so was able to move onto the Electronic and Electrical Engineering course. Lancaster’s Engineering Department is like its own little community, the amount of group projects means you know most of the people in your year across the whole range of engineering disciplines and can always get help with work.”

Laura Gould, MEng Electronic and Electrical Engineering
Mechanical Engineering is a field covering any industry that uses moving parts, from construction to transport; medicine to manufacturing; renewable energy to consumer technology. Our three year BEng is accredited by the Institution of Mechanical Engineering as meeting partial fulfilment of the educational requirements to become a Chartered Engineer.

The programme gives you the skills necessary for the subject, with an applied focus on mechanical system designs. In your first year, you’ll study core engineering and engineering mathematics subjects. Our expert tutors and world-leading resources will support the development of your analytical ability in dealing with complex systems. They will also enhance your creativity for solving problems and producing innovative designs.

In your second year, your studies will continue and include more project work and during your final year you can specialise more – building teamwork skills while developing and indulging your passion for engineering. Example projects include high-lift aerodynamics for turbine blade design, small engine efficiency improvements by water injection, exoskeleton for spinal injury rehab and stiffness and strength of bonded joints between GRP pultrusions. Projects such as these help you gain solid experience and your combination of practical and analytical skills means you will have the option of entering an exciting variety of careers.

Our four year MEng in Mechanical Engineering is fully accredited by the Institution of Mechanical Engineers and builds upon the BEng scheme offering opportunity for you to develop your leadership, entrepreneurial and management potential as well as deeper understanding in technical challenge.

Our fourth year structure operates with an alternating pattern of intensive two week taught modules followed by a week dedicated towards your group project work. Often linked with industry these projects offer the pinnacle of achievement whilst at university and have been praised by external examiners and industry.

Examples include:
- Waste water energy generation with Yorkshire Water
- Novel prototype tidal turbine with WASP Cumbria Ltd
- Performance improvement of the Sinterstation 2000 with 3D Systems Europe
- Surface finish of metallic powder bed additive manufactured part with BAE Systems and Formula Student.

Additionally, students on the MEng will undertake two short industry-linked projects. These will provide you with more in-depth knowledge and highly-valued project management and leadership experience.

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<tr>
<th>Program</th>
<th>Course Code</th>
<th>Course Length</th>
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<tr>
<td>BEng</td>
<td>H300</td>
<td>3 Years</td>
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<tr>
<td>MEng</td>
<td>H303</td>
<td>4 Years</td>
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What they say...

“The engineering courses are not only well balanced in terms of labs and lectures but also lecturers and PhD students are largely accessible if you need any help or guidance. The campus itself has great facilities and has everything you need to successfully complete your studies and still be involved in your other interests.”

Michelle Zemura, MEng Mechanical Engineering

For more information please visit lancaster.ac.uk/engineering
Mechatronics Engineering

Lancaster’s Mechatronics degree programme was the first of its kind in the UK, set up in 1984 in response to employers’ needs. Thirty years later we continue to lead the field. Mechatronic Engineering is the combination of mechanical, electronic and computer engineering. Your course takes a multi-disciplinary approach and focuses on product design and systems integration using embedded microcontrollers, computers and actuators. You will learn to master the software that drives this technology and use your new skills on individual and group projects such as equipping mobile robots with satellite navigation systems. On graduation, you will be capable of applying new technologies, promoting advanced design and introducing new and more efficient production techniques or processes.

The four year MEng is fully accredited by the Institution of Engineering and Technology and IMechE providing a direct path to becoming CEng with appropriate industrial awareness and experience. The broad technical understanding and leadership skills gained within the MEng makes Mechatronic Engineering graduates particularly attractive to industry and provides flexibility within their career often moving towards management roles. Similar to our other schemes, MEng Mechatronic Engineering students will complete a major group project as well as two short industry-linked, past examples of which include, investigation into overheating in a dimmer switch, new product design for a multi-purpose unit in the domestic kitchen market, development of a whole body sleep movement sensor, development of an acoustic sensor for field environments (offshore and onshore) and design for a sports breathing training product.

BEng: H63
Course Length: 3 Years
MEng: HHH6
Course Length: 4 Years

What they say...

“I chose the mechatronics course at Lancaster because I enjoyed learning about mechanical and electrical/electronic engineering; this degree allows me to do both. I learn so much from the academic staff who are also active researchers in their respective fields.”

Donval Parker, MEng Mechatronic Engineering
Nuclear Engineering

You will study a broad range of topics, starting with engineering and engineering mathematics subjects. You can then choose from a range of modules such as Nuclear Medicine and Nuclear Instrumentation through to Nuclear Engineering Systems and Nuclear Safety. You will develop practical skills, test and analyse your design ideas in the laboratory or through computer simulation using engineering IT tools.

Our Nuclear Engineering MEng degree programme is accredited by both the Institution of Engineering and Technology and the Institution of Mechanical Engineers. Our four year scheme which is guided by our excellence in research to nuclear instrumentation, nuclear decommissioning, and chemical processes along with our location relative to Sellafield Ltd, Westinghouse Springfield Fuels Ltd and many supporting specialist companies, puts us an international leader in nuclear engineering systems.

Nuclear applications cover a broad range of sectors from healthcare and cancer treatment through to power generation, national security and decommissioning activity. The industry is set to expand over the next ten years with estimated international spend of around £930 billion for building new reactors and £250 billion for decommissioning those coming offline, there is potential for generation of 40,000 jobs in the UK nuclear sector alone.

What they say...

“The Engineering Department at Lancaster has one of the strongest and most recognised centres for Nuclear Engineering in the UK. The course covers many complex aspects of Nuclear Engineering in detail but also covers a wide range of broad based engineering subjects. It consists of a large number of practicals which aid the development of useful skills and reinforce content from lectures.”

James Fahy, MEng Nuclear Engineering

Engineering (Study Abroad)

If you take our Study Abroad variant, you’ll spend the second year of your course studying at a partner university in North America or Australasia and it is open to all our engineering programmes regardless of selected specialisation. The courses are accredited by the relevant professional engineering institution.

We match the appropriate modules that you would study at Lancaster with those of the overseas partner institution to ensure that you have appropriate skills and prerequisites for your return to Lancaster in year three.

What they say...

“Being able to apply what I had learned in classes to real life research was truly amazing. I also got to experience a new place and culture which is definitely an added bonus!”

Sam Smith, BEng Mechanical Engineering

Many multi-national engineering companies recruit graduates with international awareness and a willingness to travel. If you want to kick start your international career by having actual experiences you can talk about then the Study Abroad route is something which you should strongly consider.
Entry requirements

Our degrees are offered as three-year BEng (Bachelor of Engineering) or four-year MEng (Master of Engineering) courses, accredited by the relevant professional engineering institution.

Students who study MEng will graduate after four years fulfilment of the academic requirements for gaining Chartered Engineer (CEng) status. Chartered Engineers enjoy excellent prospects such as enhanced employability and higher salaries.

At Lancaster, BEng students that achieve a suitable grade in their second year can upgrade to MEng in their third year.

If you apply for MEng, but do not achieve the required grades we will automatically consider you for the equivalent BEng course provided you meet BEng requirements.

A-Levels

• BEng: AAB-ABB including Mathematics and a physical science e.g. Physics/Chemistry
• MEng: AAA including Mathematics and a physical science e.g. Physics/Chemistry

*For Chemical Engineering degrees the physical science must be Chemistry

BTEC

• BEng: DDD, to DDM, in an Engineering related subject including:
  Distinctions in the Mathematics and Further Mathematics units
• MEng: DDD in an Engineering related subject including:
  Distinctions in the Mathematics and Further Mathematics units

*For Chemical Engineering degrees a BTEC will be considered alongside a Chemistry A-Level

International Baccalaureate

• BEng: 35-32 points overall with 16 points from the best 3 Higher Level subjects, including Mathematics and a Physical Science at grade 6 (Higher Level)
• MEng: 36 points overall with 16 points from the best 3 Higher Level subjects, including Mathematics and Physical Science at grade 6 (Higher Level)

*For Chemical Engineering degrees the physical science must be Chemistry

Essential Subjects to include:

• GCSE requirement - Minimum of 5 GCSE (A*-C) to include Mathematics (B), English Language (C)
• IELTS 6.5 (with at least 5.5 in each component)

We also accept entry via other national and international qualifications and value any further professional development.

What they say...

“Capitalising on skills developed, including teamwork, leadership and management, these projects provide an excellent insight into a future career as a Chartered Engineer.”

Dr Allan Rennie

Industrial projects

MEng students participate on industrial projects during their third and fourth years. These are real life company problems which whilst non business critical could still afford the companies involved meaningful time and progress. Our links with companies means that we can source challenging and constructive projects which are mutually beneficial to the companies and students involved.

King Kong Climbing

Specialists in designing and manufacturing bespoke climbing walls throughout the UK, King Kong Climbing, based at Keswick in the Lake District, approached Lancaster University’s Engineering Department to help them develop the latest concept in climbing walls – illuminated routes.

The latest idea is to use lights that are embedded within the holds to create routes for climbers to follow. This innovative system enables climbing wall owners to programme several routes of different grades up the same wall and gives climbers the option to select routes at a difficulty suitable for their skills. The students carried out the design development and produced a fully-working prototype. The LEDs are fitted into the climbing wall behind translucent holds and can be programmed from a computer on the ground below.

Dr Steve Monk said: “This was an excellent learning opportunity for the student team 4th year project to apply their knowledge in a commercial context. This provides our students with a real-world perspective which helps their transition from university into graduate-level employment.”

For more information please visit lancaster.ac.uk/engineering
Industrial experience placements

We actively encourage students to take time out of their degree to complete periods of time in industry, typically 12 to 15 months’ paid employment. These industrial opportunities can be arranged in conjunction with the University, direct with companies or through the Engineering Development Trust’s Year in Industry scheme.

Alongside CV enhancement and increased employability prospects, we have also found that students who complete a year in industry return with increased motivation for the remainder of their course having been able to put their learning so far into practice. Our strong industry links from large corporate to small local companies means that we will be able to assist you to find a suitable and rewarding placement in a sector that interests you for your future career.

As a student undertaking a year in industry placement, you’ll typically receive a salary of around £15,000 p.a. with many students also receiving funding from the company to support subsequent years of study.

Name - Adam de Loos
Company - Rolls Royce
Role - Systems and Software Verification and Validation Engineer for Civil and Large Aircraft Engines

“My main challenge was at the beginning of the placement when you are learning nobody knows you so you have to make a name for yourself and give them a good impression. As well as learning how the company keeps moving forward and finally when you are new and learning their techniques/tools that you have not had experience in before.

The highlight of the placement was being exposed to other things which you have not done before or working for other projects outside the company. For example, one day you could be in Derby and be testing the latest designs, using computer simulation to see how it will react. Then on another day you could be in Birmingham commissioning Rolls Royce at one of the company’s facility providers called TRW and using their facilities to fulfi ū different types of testing on the aircraft engines. For example, hardware interaction such as lightning strike testing.

I gained several different types of skills that I did not expect to achieve after my placement. You learn time management for sure, but you become more aware of what you can actually do when you stretch your expectations. Me personally I gained hundreds of contacts because I was in Birmingham and Derby. When I left on my final day they didn’t want to let me go. You spend so much time with your colleagues it creates a special connection that you would never forget.

Honestly it’s probably the best decision I have ever made. I’ve learnt so much from the managerial side too with my managers happy to show me the trends. Technically I gained experience in computer software packages that I’ve not experienced before and found it useful and interesting. Finally, you learn the real world, and that there is a lot of opportunities out there. Just because you have studied for one degree, does not mean you are limited to that field.”

Careers and employability

With a strong focus on industrial projects, internships and work experience, our degrees will provide you with the support you need to achieve your career aspirations.

Our undergraduate degrees provide excellent employment prospects. We provide careers advice and host a number of events throughout the year, including an annual Careers Fair.

Our graduates are keenly sought by a range of employers, such as Network Rail, EDF Energy, and Jaguar Landrover to name just a few or choose to continue with further study.

Name - Aneeka Kang
Company - Firefly - Clean Energy
Role - Mechanical design and 3D CAD modelling and simulation

“I am currently working as a Product Design Engineer at Firefly - Clean Energy, a company who design and manufacture hybrid power storage units and green off-grid power solutions. I have been primarily working on mechanical design and 3D CAD modelling and simulation.

Prior to this I worked at a global energy engineering consultancy firm called Cotopaxi Ener for 2 years. I travelled to many countries and worked with factories such as Unilever, Diageo and Florette to capture and measure the site energy balances and work with them to drive down energy consumption in the plant through data analysis and process optimisation.

The support given to me by my project supervisors and lecturers has provided me with a strong academic and practical foundation of engineering and a great platform to pursue my career path. In addition to this I worked on bringing a product from design phase right the way through to manufacture and testing phases in both my 3rd and 4th year projects. Gaining this experience prior to working in industry has been invaluable.”
About campus

The Lancaster University campus occupies a beautiful 560-acre parkland site at Bailrigg, just three miles from Lancaster city centre. With over 12,000 students and 2,500 employees within the Bailrigg campus it is now almost a small town in its own right. Lancaster is one of only a handful of universities with a collegiate system which has helped to forge a strong sense of identity and loyalty and continues to be a distinctive feature of student life at Lancaster.

Students from one hundred countries make up a thriving community based around our nine colleges, creating a culturally diverse campus in a location that boasts the combination of city, coast and countryside.

You will find shops, banks, a huge range of places to eat, a doctors surgery, pharmacy, dentist and much more. There are 9 college bars on campus, as well as a cinema, theatre and an art gallery.

There are over 200 societies covering a huge range of activities, hobbies and causes. A society is a group of like-minded students, working together to do what they love.

“Lancaster University’s Engineering Society is for everyone who’s fascinated by how things work and would like to meet new people from different backgrounds with similar ambitions. The society is a way for people to find out more about engineering as a whole; they’ll be able to get advice from other members about the degree, take part in trips, themed events and easily make friends in a positive environment. We have events for absolutely everyone, from pizza nights, bowling, pool and BBQs to themed bar crawls, industry visits and also our annual Frank Morton sports day which takes place at different universities across the country. All are great ways for people to make new friends and branch out in ways they may not have been able to before while creating even more lasting memories during their time at University!”

Sarj Dhillon
President of Engineering Society

Visit us

For more information visit: lancaster.ac.uk/visitus

Open Days

Join us at one of our Open Days to experience what life as a student at Lancaster is like. You will have the opportunity to see what facilities are available on our lively campus and to explore our beautiful 560-acre campus including our award winning accommodation, newly refurbished library, the Students’ Union and sports facilities.

You can also visit the Department where you have the opportunity to speak to our academic staff who will answer any questions you may have and tour our award winning building.

Campus Tours and Campus Tours Extra

The University organises regular campus tours to give you a flavour of life at Lancaster. The Campus Tour is designed to acquaint you with our friendly campus showing you our award winning student accommodation, social venues, library and a lot more besides!

Our Campus Tour Extra is designed for students who are starting to think about their future university option. During your visit you will be introduced to the campus and be given the opportunity to speak to both students and staff from Engineering where you will have the chance to ask any questions you may have.

Applicant Visit Days

If you are offered a place on an Engineering degree, you will be invited to visit the University on an Applicant Visit Day. Depending on the degree scheme you have applied for you may be invited for interviews. You will spend the day with current Engineering students, meet academic members of staff, and view our facilities and much more. We aim to give you a real flavour of how it feels to live and study at Lancaster.