Engineering at Lancaster
Why Engineering at Lancaster?

We’re focussed
That means:
• Small group sizes
• Low student: staff ratio
• More contact time
• A more friendly, personal experience

Practical, hands-on courses
We focus on lab based sessions and project work throughout our courses. We let you design, build and test solutions for yourself as we believe this really reinforces learning and lets you see how theory works in real life (and it’s fun!)

A campus-based University
We’re set on a beautiful self-contained 360 acre parkland campus. Lancaster is ranked in the top three safest cities in the UK

Lancaster is consistently ranked highly in all of the UK’s major university league tables, including for 2015, The Guardian (10th) and the Complete University Guide (11th).

Fantastic graduate prospects
95% of our graduates go on to work or further study within 6 months

Common First Year structure
Giving our students the fundamental engineering skills they’ll need throughout their degree and into their careers

High quality courses, accredited by the relevant professional engineering institutions
Welcome

At Lancaster our first priority is to deliver high quality, professionally accredited courses, but why else should you make Engineering at Lancaster your first choice?

Firstly, we limit the number of students we admit every year, which keeps lecture sizes small and student : staff ratio low. You’ll get to know your lecturers and support staff personally and we believe this friendly, informal and collaborative atmosphere helps our students achieve success. In your first year, you’ll benefit from weekly small group tutorials with an academic tutor, to consolidate your learning and also provide academic and pastoral support; if you’re struggling with a particular concept or problem you can get extra help here. This, combined with close matching of lectures and labs, means contact hours are productive and there is still time for personal study and reading.

Secondly, we are one of only a handful of general engineering departments in the country. We have a common first year, meaning whichever discipline you study you’ll spend your first year learning the fundamental principles of engineering before specialising from your second year onwards. Some changes of specialisation are possible at the end of the first year – a flexibility seen in few courses. Added to this, throughout your degree, you’ll undertake stimulating and challenging projects working in mixed-discipline teams that reflect a genuine work environment. Our approach gives our graduates the edge; employers require engineers with a comprehensive knowledge base who can apply their skills in multidisciplinary teams and projects. The success of this approach is reflected in our exceptional graduate employment statistics (95%).

Finally, in addition to maintaining a high teaching quality, we focus on the overall quality of our students’ experience. We are a self-contained, campus-based university, boasting multi-award winning accommodation and state-of-the-art teaching, learning and sports facilities. Lancaster is a vibrant, historical and cultural city, located on the cusp of beautiful coastline and spectacular national parks. It also has excellent connections, sitting on the railway West Coast Main Line, next to the M6 and close to an international airport. We really do offer the best of city, coast and countryside!

We’re sure you’ll agree that Engineering at Lancaster offers a high quality education in a unique environment and an unrivalled overall experience.
The New Face of Engineering at Lancaster

We are excited to announce that construction of our new state-of-the-art Engineering building is currently under way.

Our innovative, purpose-built building will provide world-class facilities for students of Engineering at Lancaster through the creation of high quality, attractive working environments. The construction of new lab and research facilities, as well as flexible teaching spaces where students can work in a variety of ways outside of the traditional learning environment will enhance the quality of our students’ experience.

The new building will give us the opportunity to strengthen our teaching and research in our key specialisms, as well as providing opportunities for future growth.

This is the start of an exciting period for Engineering at Lancaster, and we hope that you will be able to join us for it.
We’re investing in your future

It is currently a very exciting time for Engineering at Lancaster. Whilst as a university we have invested over £450 million into our campus since 2002 rendering it one of the premier university campuses on which to study in the UK, we are currently constructing a new building specifically for the Engineering Department.

This will radically transform the way in which we operate and underpin the quality of learning experience our students enjoy during their time with us. We have also recently been able to significantly increase the size of our academic staff base. This development will complement the new engineering facilities and will ensure that learning with us continues to be supported by international leaders in their field from across the Engineering profession.

I hope you will choose to exploit these developments, visit to find out more and join in with these exciting times.

Professor Malcolm Joyce
Head of Engineering at Lancaster
Why Lancaster University?

Lancaster University was founded in 1964 and has since built a reputation both in terms of quality of teaching and research. It is consistently ranked highly in all the UK's major university league tables, and is in the top 1% of universities worldwide.

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.

More than £450m has been invested into Lancaster University’s campus since 2002, creating new academic facilities, social spaces and sports facilities and improved teaching spaces. Campus plays host to a variety of shops, banks, food and drink outlets, a theatre, cinema and an art gallery.

Lancaster’s accommodation retained the award for 'Best University Halls' for the fourth time in the 2013 National Student Housing Survey.

We are one of only five institutions to achieve the International Accommodation Quality Mark, awarded where satisfaction among international students is 90% or higher.

Lancaster students can revel in the knowledge that they are not only studying in one of the safest self-contained campuses in the UK, but also have some of the country’s most unspoilt spots on their doorsteps - from country villages, seaside resorts and the lush countryside of the Lake District and Forest of Bowland to the historic and vibrant city of Lancaster.

Lancaster boasts boutique shops alongside high street stores, bijou cafes alongside top quality restaurants, and cosy pubs alongside upmarket wine bars and nightclubs. Lancaster’s population is around 25% students, meaning that every night is student night and we like to think we’re one of the most friendly and welcoming student cities in the UK.
Graduate Prospects

In the past our graduates have gone to work for multinational companies such as those listed below.

95% of Lancaster’s engineering students are employed within 6 months of graduating (Unistats, 2014, www.unistats.direct.gov.uk).

Information from the most recent Higher Education Statistics Agency survey is replicated opposite.

As you can see, 40% of the top 15 graduate salaries can be attributed to engineering courses.

The average starting salary for Lancaster University graduates in 2013 was £26,500.

<table>
<thead>
<tr>
<th>Course</th>
<th>Salary</th>
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<tbody>
<tr>
<td>Dentistry</td>
<td>£30,681</td>
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<tr>
<td>Chemical Engineering</td>
<td>£28,992</td>
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<tr>
<td>Medicine</td>
<td>£28,871</td>
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<tr>
<td>General Engineering</td>
<td>£27,280</td>
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<tr>
<td>Mechanical Engineering</td>
<td>£26,197</td>
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<tr>
<td>Economics</td>
<td>£26,146</td>
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<tr>
<td>Veterinary Medicine</td>
<td>£26,045</td>
</tr>
<tr>
<td>Aeronautical and Manufacturing Engineering</td>
<td>£25,061</td>
</tr>
<tr>
<td>Materials Technology</td>
<td>£24,870</td>
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<tr>
<td>Physics &amp; Astronomy</td>
<td>£24,504</td>
</tr>
<tr>
<td>Mathematics</td>
<td>£24,437</td>
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<tr>
<td>Electrical and Electronic Engineering</td>
<td>£24,390</td>
</tr>
<tr>
<td>Librarianship &amp; Information Management</td>
<td>£24,038</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>£23,947</td>
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<tr>
<td>Geology</td>
<td>£23,766</td>
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</tbody>
</table>

Source: thecompleteuniversityguide.co.uk, 2014
Entry Requirements

Engineering applies the tools of mathematics to our understanding in science using the creativity of design, we therefore look for these academic skills along with any relevant experience when judging candidates for entry. Typical offer levels are outlined below.

A-levels
• BEng: ABB including Mathematics and a physical science i.e. Physics/Chemistry
• MEng: AAA including Mathematics and a physical science i.e. Physics/Chemistry
For Chemical Engineering degrees the physical science must be Chemistry.

BTEC
• BEng DDM in an appropriate subject including the Further Maths module
• MEng DDD in an appropriate subject including the Further Maths module
GCSE grades B in Mathematics and C in English are also required

International Baccalaureate
• BEng: 32pts overall with 16pts from best 3 HL subjects to include Mathematics at HL
• MEng: 36 points overall with 16 points from best 3 HL subjects to include Mathematics at HL
For overseas students the IELTS requirement is 6.5

We also allow entry via other national and international qualifications including HNC/ HND and foundation years and value any further professional development.

Please contact the Undergraduate Admissions Office via ugadmissions@lancaster.ac.uk or +44 (0)1524 592028 for information about qualification not listed or direct entry.

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 with full fulfilment of the academic requirements en route to 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.
First Year Structure

All our undergraduate courses begin with a common first year, meaning no matter which discipline you choose you’ll study the same combination of engineering and engineering mathematics modules.

This is designed to give you a broad understanding of the fundamental principles of modern engineering, which you’ll need throughout your degree and going forwards into your career. Industry welcomes this broad knowledge base, requiring engineers that can integrate into multidisciplinary teams and varying projects.

At the end of the first year students make an informed choice of their selected specialisation. Numbers on schemes are not capped allowing flexibility to change degree scheme from your original UCAS application.

**Engineering**

- Design, Innovation and 3-D Thinking
- Electrical and Electronic Fundamentals
- Electronic Information System Design
- Energy, Technology and Sustainability
- Sensing and Signals
- Computers and Control
- Strength and Materials
- Fundamentals of Digital Electronics
- The World of Manufacture
- Transport Technology
- Chemistry for engineers
- Process engineering fundamentals

**Engineering Mathematics**

- Introductory Engineering Mathematics: Determinants, Vectors and Complex Numbers
- Calculus
- Differential equations
- Further Engineering Mathematics: Further Calculus and Numerical Techniques
What will my workload be like?

You will study a total of 15 modules in your first year (11 engineering and 4 maths). Your weekly workload will typically consist of 10 hours of lectures, and 6 hours of lab/project work, plus small group tutorials and workshops. Although help is readily available if you need it there is still time for personal study and reading.

After your first year you will move to your chosen specialisation, as listed overleaf. It is also possible to switch to a different specialisation at this stage if what you have studied during your first year has changed your mind. If you're completely unsure of which area of specialisation you'd like to go into you can also begin on BEng Engineering (UCAS code H100) and choose at the end of the first year.

<table>
<thead>
<tr>
<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THU</th>
<th>FRI</th>
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<tbody>
<tr>
<td>9.00 Mechanical Engineering Lecture</td>
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<td>9.00</td>
<td>9.00 Electronic Engineering Lecture</td>
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<td>10.00 Electronic Engineering Lecture</td>
<td>10.00 Engineering Mathematics Lecture</td>
<td>10.00 Mechanical Engineering Lecture</td>
<td>10.00 Engineering Tutorial</td>
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<tr>
<td>11.00</td>
<td>11.00 Electronic Engineering Lecture</td>
<td>11.00 Electronic Engineering Lecture</td>
<td>11.00 Engineering Mathematics Lecture</td>
<td>11.00 - 13.00 Workshops</td>
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<tr>
<td>12.00 Chemical Engineering Lecture</td>
<td>12.00 Mechanical Engineering Lecture</td>
<td>Wednesday afternoon is reserved for recreation and extracurricular activities'</td>
<td>12.00 Chemical Engineering Lecture</td>
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<tr>
<td>13.00 Engineering Mathematics Lecture</td>
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<tr>
<td>14.00</td>
<td>14.00 - 17.00 Engineering Lab Session Project Work</td>
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<td>14.00 - 17.00 Practicals Project Work</td>
<td>14.00 - 17.00 Engineering Lab Session Project Work</td>
</tr>
<tr>
<td>15.00 Chemical Engineering Lecture</td>
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<td>16.00</td>
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Timetable for Computer Systems Engineering differs slightly
Chemical Engineering
BEng: H800, MEng: H811

Why study Chemical Engineering?
Chemical engineers play a crucial role in everyday life and are employed across a huge variety of sectors from chemicals and allied products through to water, energy, and oil and gas. Chemical engineers have technical knowledge of chemistry, biochemistry, engineering, materials science and information technology with additional skills in management, safety and the environment. Chemical engineers enjoy excellent career prospects remaining one of the best-paying professions in the UK. Surveys show that chemical engineers earn more, on average, than other types of engineer and more than pure scientists.

Why Lancaster?
These two new undergraduate programmes aim to equip graduates with a sound foundation in the essentials of engineering science, together with a deeper understanding to integrate their chemical engineering specialism, so that they acquire the characteristics of future leaders of the engineering profession. At Lancaster world-renowned research in the fields of nuclear, chemical and energy industries contribute towards teaching, enhancing the curriculum and providing insight to cutting edge technology and techniques. Chemical engineers have many career opportunities. A graduate might perform groundbreaking scientific research, work as a field engineer, or occupy a senior management position. Graduates employed by multinational companies often have opportunity to travel all over the world. As it is a relatively new scheme of study at Lancaster, we will seek course accreditation from the Institution of Chemical Engineers when appropriate to do so.

Student Profile
I chose Lancaster as it just seemed a friendlier place. It was very easy to settle in and everyone was very friendly, plus the Colleges make the uni a great place to be as your feel you’re part of something, especially during Freshers’ week.

The Engineering Department feels like a second home! Practical lab sessions allow you to get to know your lecturers and you’re not sat in a lecture theatre presented with slide upon slide! You can bring up issues with lecturers and see how what you’re learning in lectures can be used in a practical sense.

Engineering staff are supportive and technicians are always happy to help. If you do need extra help, you can always count on your tutor both inside and outside of the weekly tutorials. The amount of contact time at Lancaster is higher than other universities I looked at.

Zoe Minnett
2nd Year BEng Chemical Engineering
Modules (For 1st year Modules see page 09)

Second Year:
- Engineering Analysis
- Instrumentation and Control
- Business Development Project
- Fluid Mechanics and Thermodynamics
- Kinetics, Phase Transfers and Reaction Engineering
- Process Transfers of Mass and Heat
- Particle Technology and Separation Processes
- Engineering Design Project

Year in industry (optional)

Third Year:
- Engineering Management
- Electrical & Fluid Drives and Actuators
- Energy Conversion
- Advanced Process Transfers
- Computer Applications to Chemical Engineering
- Chemical Engineering Design and Process Safety
- Individual Project

Fourth Year:
- Leadership in Technology
- Renewable Energy
- Nuclear Engineering Systems
- Groundwater Resources and Protection or Smart Systems
- Chemical Risk Assessment
- Electrochemical Engineering
- Group Project

BEng in Chemical Engineering

MEng in Chemical Engineering
**Computer Systems Engineering**

**BEng: HH66, MEng: HHP6**

*Why study Computer Systems Engineering?*

A large part of the technological advancements and innovations that underpin life in modern society can be traced to the digital revolution that started in the late 1970s and early 80s. Every major sector that we count on as essential to our wellbeing such as medical, transport, and consumer sectors has been transformed by the availability of very cheap but very powerful processors. Hence their design and use is a critical skill that will be in demand regardless of periodic fluctuations in the national and world economies.

*Why Lancaster?*

Studying Computer Systems Engineering at Lancaster will train you in both hardware and software aspects, relating to designing and architecting the processor, as well as engineering software solutions for different application domains. Thus you have the freedom to specialise in a wide variety of fields. The hardware element is delivered by the Engineering Department, specialising in electronic systems and semiconductor electronics, whilst the software element is taught by staff from the School of Computing and Communications specialising in software design and engineering.

The academics on this course have world-leading experience and are professionals who practice their art, and have a key role in the future development of technology and products. Studying at Lancaster will therefore ensure that you gain the most up-to-date and modern exposure to the discipline, with many examples of industrial practice and exposure to potential employers.

*Student Profile*

I’ve always been interested in computers since I was small, so I always knew what I wanted to study when I went to University. When I looked at Lancaster, the Computer Systems Engineering course really stood out to me as it combined my passion for computer science and software design with engineering skills, which I believe will be really valuable in my future career. I was particularly attracted by the graduate prospects and salary that a degree in an engineering subject can command. Personally, this university stood out from other universities for its reputation and location. I thought its excellence in technology would be attractive to employers. The opportunities I’ve had here at Lancaster have been excellent, and I’ve particularly enjoyed the project work. I have loved every minute at Lancaster!

**Chris North**

3rd Year BEng Computer Systems Engineering
Modules (For 1st year Modules see page 09)

Second Year:
- Electromagnetics and RF Engineering
- Digital Electronics
- Electrical Circuits and Power Systems
- Engineering Analysis
- Software Design
- Networking
- Operating Systems
- Computer Science Group Project

Year in industry (optional)

Third Year:
- Engineering Management
- Leadership in Technology (MEng Only)
- Distributed Systems
- Integrated Circuit Engineering
- Programmable Systems
- Optoelectronics
- Artificial Intelligence
- Individual Project

Fourth Year:
- Design and Modelling of Systems
- Industrial Project
- Intelligent Control
- Smart Systems
- Embedded Systems
- Group Project

BEng in Computer Systems Engineering

MEng in Computer Systems Engineering
Electronic & Electrical Engineering

BEng: H607, MEng: H606

Why Study Electronic & Electrical Engineering?

No discipline has had a greater impact on industrial development and everyday life than Electronic and Electrical Engineering. Every year sees the production of thousands of complex communications and control networks, hundreds of thousands of pieces of lifesaving equipment, millions of home appliances, and hundreds of millions of smartphones and tablets. Systems in fields as diverse as healthcare, transportation, entertainment, space exploration, security and communications need electrical and electronic engineers to be a reality.

Electronic and Electrical Engineering is still developing rapidly so is a field that is only likely to have more and more influence as time goes on. If you would like to be specialise in one of the most exciting and fast changing technology fields then you should consider this.

Why Lancaster?

Electronic and Electrical Engineering at Lancaster offers one of the higher staff:student ratio among the UK Electronic and Electrical Engineering courses and offers a clear learning path from the fundamentals to the most advanced topics. Professors and lecturers with international reputations in a range of cutting edge technologies, ranging from integrated circuits to radiofrequency and nanotechnologies, create an exciting study environment. You will receive the benefit of their guidance, industry-orientated practical experience and a wide range of exciting projects in the later stages of the course. There is strong demand for electronic and electrical engineers across all sectors and all continents and you will finally graduate with the skills required to take advantage of that.

Student Profile

I chose Electronic and Electrical Engineering because the course, particularly the integrated Masters and exchange programme, suited my interests. The syllabus is broad but also allows for a good level of specialisation and the content continues to fascinate me. Resources at Lancaster are good, and class sizes are often quite small.

The proximity to the Lake District and Morecambe Bay places this rural campus in a beautiful setting and the city is very student-friendly, and we account for over 25% of the population.

My decision to come to Lancaster was deeply connected to my decision that an exchange programme was a good idea; study abroad is excellent, and I’d encourage everyone to do it! Work placements in 3rd year and summer internships are a great opportunity for getting experience.

I have spent my past 3 summers working in California, Switzerland, and Taiwan!

Peter Burkimsher
4th Year MEng Electronic & Electrical Engineering
Modules (For 1st year Modules see page 09)

**Second Year:**
- Electromagnetics and RF Engineering
- Digital Electronics
- Electrical Circuits and Power Systems
- Engineering Analysis
- Control and Instrumentation
- Power and Heat
- Engineering Projects
- Business Development Project

**Year in industry (optional)**

**Third Year:**
- Engineering Management
- Leadership in Technology (MEng Only)
- Electrical and Fluid Drives and Actuators
- Integrated Circuit Engineering
- Programmable Systems
- Analogue Electronics
- Optoelectronics
- Individual Project

**Fourth Year:**
- Design and Modelling of Systems
- Industrial Project
- Intelligent Control
- Smart Systems
- Embedded Systems
- Group Project

**BEng in Electronic and Electrical Engineering**

**MEng in Electronic and Electrical Engineering**
Mechanical Engineering

BEng: H300, MEng: H303

Why Study Mechanical Engineering?
Mechanical Engineering forms the basis of just about anything that has movable parts – including areas like transport, renewable energy, medicine and manufacturing. The skill of the modern mechanical engineer is to design products economically and without damage to the environment. These areas will continue to be important to the UK economy, and to all developed countries worldwide, meaning that Mechanical Engineers are highly versatile and will be in great demand across a wide range of industries for years to come.

Why Lancaster?
At Lancaster, our Mechanical Engineering course is focused on providing you with both the theoretical skills required by a modern engineer and the ability to apply them. It covers a substantial amount of material on the border of electronic and mechanical engineering, such as control system design, which is necessary for the mechanical engineer in the modern era. Throughout the course you will have the ability to apply these skills in creative projects, working both individually or as part of a team. If desired this may also include joining our Formula Student racing team in the final year.

A degree in Mechanical Engineering is the basis for a career in a wide range of professions: Mechanical Engineers are valued for their analytical and innovative abilities in many industries, and just in a technical capacity.

Student Profile
I chose Mechanical Engineering because I have always wanted to know how things worked. In school I liked maths, but I wanted to design things as well. Engineering let me do both!

I thought Lancaster was a great buzzing campus with a lot going on. I liked the fact that everything you could need was contained on campus (as well as 9 bars). All of the lecturers know their students on a one to one basis, and are very easy to approach. There is a lot of contact time between students and academics, which gives you more time to ask questions and learn more.

I liked the department instantly, the staff were very friendly and everyone knows each other by their first name. Lancaster itself just had a very friendly and fun atmosphere, and being so close to the Lake District was a selling point too, as it meant I could go out on my bike or for a hike at the drop of a hat. I’ve had the time of my life at Lancaster!

Paul Edwards
4th Year MEng Mechanical Engineering
Modules (For 1st year Modules see page 09)

Second Year:
- Engineering Analysis
- Control and Instrumentation
- Power and Heat
- Engineering Projects
- Business Development Project
- Mechanics and Vibrations
- Fluid Mechanics and Thermodynamics
- Materials and Design

Year in industry (optional)

Third Year:
- Mechanics
- Engineering Management
- Engineering Materials
- Design and Manufacturing
- Leadership in Technology (MEng Only)
- Electrical and Fluid Drives and Actuators
- Machine Elements
- Individual Project

Fourth Year:
- Design and Modelling of Systems
- Industrial Project
- Intelligent Control
- Advanced CAD/CAM
- Mechanics and Actuators
- Group Project

BEng in Mechanical Engineering

MEng in Mechanical Engineering
Mechatronic Engineering

BEng: HH63, MEng: HHH6

Why study Mechatronic Engineering?
Mechatronic Engineering is the combination of mechanical, electronic and computer engineering. Most modern equipment has a mechanical function that is controlled by electronics and microprocessors, meaning that Mechatronic Engineering and engineers with these skills are highly sought after. Think of it as general engineering fit for the 21st century.

Why Lancaster?
Lancaster’s Mechatronic Engineering course was the first of its kind in the UK when it was established in 1984, and was developed as a response to the industry’s need for engineers who can work within an interdisciplinary environment. The emphasis is on product design and systems integration involving sensors, embedded microcontrollers and computers and actuators, together with appropriate software techniques. In the later parts of the course, such as your individual or group project, you can get involved with some challenging research projects, such as interfacing satellite navigation systems to mobile robots.

The track record of Lancaster Mechatronics graduates shows that they perform valuable roles, such as coordinating more specialist engineers in engineering management or running their own businesses.

Student Profile
When I first came to university, I wasn’t really sure which discipline I wanted to study. The great thing about Lancaster is that the common first year meant I gained understanding of all disciplines and provided a good grounding from which to decide which specialism to take. I chose Mechatronic Engineering as I’d really enjoyed mechanical and electrical engineering in my first year and this gave me the opportunity to continue to study both. I also believe that ever-advancing technology means there are exciting career prospects for engineers with these skills.

I’ve had a fair amount of contact hours, especially in the years 1 and 2. The other good thing is that all engineering disciplines study and work together, rather than being segregated like in other universities. The social side of university is great, and at Lancaster on-campus accommodation and the college set up makes the experience even better. I’m in Pendle College.

Ben Gibbins
4th Year MEng Mechatronic Engineering
**Modules**  (For 1st year Modules see page 09)

**Second Year:**
- Electrical Circuits and Power Systems
- Business Development Project
- Engineering Analysis
- Control and Instrumentation
- Power and Heat
- Engineering Projects
- Digital Electronics OR
- Materials and Design

**Third Year:**
- Programmable Systems
- Engineering Management
- Engineering Materials
- Mechanics
- Leadership in Technology (MEng Only)
- Electrical and Fluid Drives and Actuators
- Machine Elements
- Individual Project

**Fourth Year:**
- Design and Modelling of Systems
- Industrial Project
- Intelligent Control
- Interfacing and Integration
- Mechanics and Actuators
- Group Project

**Year in industry (optional)**

**BEng in Mechatronic Engineering**

**MEng in Mechatronic Engineering**
Nuclear Engineering
BEng: H820, MEng H821

Why study Nuclear Engineering?
Nuclear Engineering is a challenging discipline that forms the backbone to the business of many organisations, large and small, in the power, medical, defence and security sectors. Now is the perfect time to study for a degree in Nuclear Engineering; with the Worldwide quota of nuclear power reactors exceeding 450 and a widespread intention to significantly expand capacity in order to reduce our dependence on fossil fuels for electricity.

Why Lancaster?
At Lancaster we have world-renowned academics in the field leading the course. You will learn about key nuclear engineering systems and the chemical engineering on which these designs rely. Subsequently, you will be introduced to the needs of nuclear medicine, instrumentation and decommissioning. In fourth year you will study alongside industry-based students with a focus on nuclear safety and pursue a larger team-based nuclear research project. Several short, compulsory secondments will introduce you to the engineering industry, which will give you valuable experience for your future career.

Our Nuclear Engineering graduates are highly numerate and capable with well developed analytical skills, making them attractive both to the nuclear industry and also to many sectors outside of the discipline; thus our Nuclear Engineering graduates have many career options open to them when they graduate. Nuclear Engineering offers a sound start to any high-flier’s engineering career with great career variety and opportunity throughout the world.

Student Profile
I chose to study Nuclear Engineering as it’s exciting and not well understood by the public; it is the future of energy generation and currently at the forefront of engineering. On top of this Lancaster have several staff members who are very influential within the nuclear industry.

The degree scheme offers a good balance between tough mathematical, interesting and creative modules, with a range of group and individual projects. The class sizes are small, which improves the quality of teaching and gives a more personal touch to the department; you really get to know the lecturers on a personal level.

Campus accommodation is great and allows you to easily get involved in sports and societies, meet people and have a large circle of friends. Also it provides you with the unique opportunity to roll out of bed ten minutes before your 9am lecture and not be late!

Craig Jantzen
4th Year MEng Nuclear Engineering
**Modules** (For 1st year Modules see page 09)

### Second Year:
- Business Development Project
- Engineering Analysis
- Control and Instrumentation
- Electromagnetics and RF Engineering
- Power and Heat
- Engineering Projects
- Nuclear Engineering
- Decommissioning and Sustainability

### Third Year:
- Engineering Management
- Engineering Materials
- Leadership in Technology (MEng Only)
- Electrical and Fluid Drives and Actuators
- Integrated Circuit Engineering
- Nuclear Medicine
- Nuclear Instrumentation
- Individual Project

### Fourth Year:
- Design and Modelling of Systems
- Industrial Project
- Intelligent Control
- Nuclear Safety and Design
- Nuclear Engineering
- Group Project

### Year in Industry (optional)

### BEng in Nuclear Engineering

### MEng in Nuclear Engineering
Sustainable Engineering

BEng: H220, MEng: H224

Why Sustainable Engineering?

The World is facing an energy crisis. By 2030, our global power demand will have increased by 60%. This, coupled with a targeted 80% reduction in CO2 emissions by 2050 mean that future engineers must create an energy infrastructure with technologies capable of delivering affordable, secure, low-carbon energy for years to come.

Sustainable engineering is a new, and very topical, area of study focusing on engineering in the context of the growing concern for the environmental, social and economic impact that traditional processes have on the natural environment. As awareness and legislation in this area is tightened up, demand for engineers with these skills will increase; thus providing graduates with a wide range of opportunities in multiple sectors.

Why Lancaster?

With input from industry and a range of engineering disciplines, students will gain a broad understanding of engineering science with a focus on sustainable engineering so that they are well prepared to become competent professional engineers able to cope with changes. Our course will provide students with skills and knowledge to be able to design and implement sustainable systems and technology in the material, manufacturing and energy sectors. You will focus on the themes of natural resources; sustainable development and sustainability indicators; end-of-life: recycling and energy recovery; legislative constraints and requirements; nuclear decommissioning; microgeneration techniques for built environment; renewable energy; energy conversion; design and manufacture; and life cycle analysis. Project work is typically centred on renewable energy systems.

Student Profile

One of the main reasons I applied for a degree in the UK was to gain a different academic perspective and an international approach to engineering. The structure of Lancaster’s Sustainable Engineering course appealed to me as it offers an excellent grounding in mechanical engineering whilst focussing on renewable energy technologies and sustainability issues.

The department is relatively small which gives you the opportunity to make acquaintances with staff as well as students from different year groups and disciplines. Furthermore, the first year tutorials provide excellent teaching support.

I have really, really enjoyed my course, especially my final year which I think is due to the group project. It allows you to apply everything you have learned throughout your degree and prepares you for real life!

Nilla-Helene Karlsen

4th Year MEng Sustainable Engineering
Modules (For 1st year Modules see page 09)

Second Year
- Business Development Project
- Engineering Analysis
- Control and Instrumentation
- Power and Heat
- Engineering Projects
- Mechanics and Vibrations
- Fluid Mechanics and Thermodynamics
- Decommissioning and Sustainability

Year in industry (optional)

Third Year
- Engineering Management
- Leadership in Technology (MEng Only)
- Electrical and Fluid Drives and Actuators
- Design and Manufacturing
- Machine Elements
- Energy Conversion
- Life Cycle Analysis
- Individual Project

Fourth Year
- Design and Modelling of Systems
- Industrial Project
- Intelligent Control
- Renewable Energy
- Mechanics and Actuators
- Group Project

BEng in Sustainable Engineering

MEng in Sustainable Engineering
Engineering (Study Abroad)
BEng: H101, MEng: H104

The world is shrinking and with growth in many international economies employers are increasingly looking for graduates with international awareness.

For over 20 years, Lancaster University has offered a successful exchange scheme with universities in the USA and Australia. All our Engineering courses offer our students a chance to spend their second year immersing themselves in the cultural and social life of another country, gaining unforgettable and rewarding life experiences and an insight into engineering in a different country.

Students need to be well prepared academically in order to make the switch to the international university system; therefore candidates are required to obtain good results in their first year of study (60% and above).

Unlike other universities, the year abroad is credited as part of the Lancaster degree meaning that it adds no additional years of study to the degree and students join back up with their class mates after their year abroad. We have worked closely with our partner institutions to make sure our students cover a similar syllabus and receive a similar level of academic support as they would here at Lancaster. Every effort is made to minimise the culture shock and the university can offer advice about insurance, visas, money and other practical considerations.

Lancaster University will waive 85% of your tuition fee for the year abroad for students admitted in 2014/15. There are no additional tuition fees payable to your overseas university. Please see www.lancs.ac.uk/study/international-students/study-abroad/outgoing for more information.

Student Profile

I never imagined in my wildest dreams when I decided to study at Lancaster that I would spend my 2nd year in the USA and the summer between my 3rd and 4th year gaining work experience at CERN in Geneva, Switzerland!

I spent my year abroad at Montana State University. The town was small, but I was surprised at how easily people took me under their wing and helped me settle into my new surroundings – friendly is an understatement! I was able to learn to ski, play American Football, visit a friend on a similar study abroad year from Lancaster in Toronto at Spring Break, and even indulge in a spot of fishing and hunting out in the mountains during Thanksgiving.

The lectures and modules I took were interesting and have come in handy since. It was interesting to see how other people look at engineering, and compare them to my experiences up to that point. It is a time I will never, ever forget.

Oliver Booth
4th Year MEng Engineering
Industrial Experience

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 though 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.
Industrial Projects

MEng students also 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. Again, our links with companies mean that we can source excellent challenging and constructive projects which are mutually beneficial to the companies and students involved. In the past, projects have involved:

- Build and test of an aerodynamic-enhancing system for HGVs;
- Contribution to steering wheel design for the Bloodhound Super Sonic Car;
- Conceptual design of a diamond wire subsea pipe cutter;
- Maximising electricity from solar energy in small-scale installations;
- Heat distribution investigation for a gas safety product;
- Production process improvement in micro-manufacturing in developing countries;
- Simulation and design recommendation for airport vehicular luggage systems.

Student Profile

Loren Wright is spending a year in the technical department at CERN working on cryostats for particle accelerators as part of the CERN Technical Students programme.

“The whole experience has been incredibly exciting, from working with some of the world’s most intelligent people to living in a beautiful and new environment. I didn’t think I’d be successful in obtaining the placement with it being such a prestigious place, so I was over the moon and couldn’t wait to start!”

The LHC has been generating data for the past few years in order to find the Higgs boson. But now it has it is taking a well earned rest and in the meantime Loren is helping to increase its energy reach for when it returns. During the break (known as Long Shutdown 1 or LS1), the interconnections will be repaired on 10,000 magnets. To do so they need to punch a hole in the thermal shields around the magnets at the interconnections. All the welds will then be replaced with bolts for future ease of access and maintenance. However no current hole punch is small enough to fit while having enough force to puncture the shield, and using a hand drill is both awkward and time costly, hence a new hole punch was required.

The task for designing this fell to Loren.

“For the design, we ran into a few problems; I had to do a lot of stress analysis and modifying of the original design in order to reduce stress intensities as we need each hole punch to do around 1000 cycles, and therefore cannot have extreme plasticisation within the material as this would lead to earlier failure. This meant employing several techniques such as filleting sharp edges and reducing large jumps in material thickness through the component. The design itself is now complete and the technical drawings have been approved for manufacture, so now it is just a case of liaising with French suppliers over ordering some of the components!”

Loren Wright
3rd Year MEng Mechanical Engineering
FAQs

Is Engineering the right course for me?
Engineering is an exciting career that addresses many of the challenges in the modern world. While many higher education courses can analyse the effects of climate change, the environmental benefits of hybrid vehicles or a shortage of clean drinking water in fast-growing cities, only in Engineering can students work on the design of equipment and systems that can make a difference to people’s lives.

Engineering courses give students the opportunity to use creativity and imagination. At several times throughout the course, students work in groups on projects and, in their third year, they have the opportunity to plan and manage their own projects. If you enjoy independent thought, creativity, lateral thinking and managing your own projects and you have the appropriate qualifications, an Engineering course is for you!

How will my work be assessed?
For both MEng and BEng degrees, there is generally a 60/40 split between marks for end of year examinations and those for projects and coursework.

Are your courses accredited?
All our MEng degree schemes are accredited by either the IET or IMechE as fulfilling the educational requirements for Chartered Engineer status. We intend to seek accreditation from the IChemE for our new Chemical Engineering courses when we are able to do so.

Are there any scholarships or grants available?
Lancaster University has committed £3.7m in scholarships and bursaries to help with fees and living costs. Our financial support depends on your circumstances and how well you do in your A Levels (or equivalent). To check your eligibility, please visit www.lancs.ac.uk/study/undergraduate/fees-and-funding for further information.

How do I apply?
You must apply via the Universities and Colleges Admissions Service (UCAS). Please visit their website www.ucas.ac.uk for further information.

Can I come and visit campus?
Sure, we’d love you to come and visit us! Come along to one of our annual Visit Days or Campus Tours. See www.lancaster.ac.uk/study/visit-days-and-campus-tours for a list of available dates.

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