## School of Mechanical Engineering

FACULTY OF ENGINEERING

# UNIVERSITY OF LEEDS

## Undergraduate Degree Courses 2013





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## School of Mechanical Engineering



### The School of Mechanical Engineering is one of the leading mechanical engineering departments in the UK and a leader in the field internationally according to the latest Research Assessment Exercise (RAE).

This means that our research activity is rated internationally excellent or world leading, putting our students at the forefront of technical developments and research. The applied research undertaken in the School feeds into the learning and teaching of our students.

All of our degree courses are accredited by the Institution of Mechanical Engineers (IMechE), vital if you want to become a Chartered Engineer after graduation. Accreditation for our Mechanical with Nuclear Engineering degree course is being sought from the IMechE.

The School has strong links with industry and is highly regarded by employers outside so not only will you study for an exciting degree, you will also have excellent career prospects. Careers in the field of mechanical engineering are wide-ranging and employment prospects are excellent. As a Mechanical Engineer you will play an instrumental role in the design and manufacture of items that impact on modern living and our everyday lives, whether it's household goods, sports equipment, reliable cars or transport systems.

Mechanical Engineers play a key role in the development of new technologies, which often have to operate dependably in difficult environments: from life-enhancing medical implants and robots for volcanic exploration to large-scale projects such as the International Space Station.

### www.engineering.leeds.ac.uk/mechanical

Whilst technical knowledge is crucial, engineers must have the skills to work effectively in teams. They have to be able to manage projects and to make complex decisions where there may be many competing factors. The design of a rollercoaster is one such example. As an engineer on such a project, safety and reliability are paramount, but you may also want the passengers to be scared, and the final design would need to be strong enough to last well, but not over-engineered so that it is too expensive to buy in the first place.

In many ways, the challenges facing engineers are greater now than they have ever been. It is through their skills and technical expertise that today's engineers can combine the latest advances in materials and design tools, with a fundamental understanding of engineering science, to design and manufacture goods that are more reliable and environmentally sustainable. These challenges ensure there will always be rewarding and well-paid careers for qualified mechanical engineers.

Our ground breaking research feeds directly into teaching, you will be taught by academics at the forefront of their subject and in an environment where knowledge is created. Through our research and the funding it attracts, we are able to invest in world-class facilities and staff who enthuse and inspire you.

You will benefit from our integrated style of learning and teaching. Lectures will be up to date and based on research that is happening now and delivered by the people who are doing the research. Laboratory classes, project work and industry sponsored fieldwork allow you to gain hands-on experience investigating and applying material from your lectures and tutorials to real-life work situations.

You can choose from our flexible range of modules to reflect your interest or career plans and with practical work being a core part of your study, you can really get to grips with your subject and prepare yourself for a career in this varied and exciting industry.

You will be assessed through both written examinations, held at the end of each year, and coursework in the form of reports, projects, presentations and posters.

Our personal tutorial system will help you to integrate quickly and settle down easily into university life. You will be assigned to a tutorial group and you'll have one-to-one time with your personal tutor. The School has excellent student support - student support teams are located close to where you work and study, ensuring personalised and direct contact.

#### Integrated Masters

All of our degrees are Integrated Masters (MEng, BEng) degrees providing you with great breadth and depth of study. You can graduate after 3 years with a BEng degree or continue for another year to complete the MEng, the full preferred engineering qualification, which fulfils all of the necessary academic requirements on the route to Chartered Engineer status.

If you choose to do an Integrated Masters you will have the opportunity to work on a greater range of project work. As a result of our strong industrial links the team-based project work will have a greater degree of industrial involvement.

Alternatively you may decide to graduate with a highly regarded both nationally and internationally BEng degree after 3 years. This may be because you plan to take a specialist one year MSc postgraduate degree or research degree in the form of a PhD.





#### Facilities

You will have access to specialist facilities and laboratories that are equipped with the latest technology including extensive laboratory space and equipment for subjects such as solid mechanics (e.g. testing of modern composite materials), fluid mechanics (e.g. using wind tunnels for measuring lift and drag on wings), engine testing and thermofluids (e.g. mapping engines and determining optimum running conditions) and control and dynamics (e.g. using computers to control mechanical systems).

You will also enjoy excellent teaching facilities and resources that the School has to offer such as our modern CAD cluster and workshop facilities which include various rapid prototyping systems, and well-equipped lecture theatres and laboratories.

#### The LabVIEW Academy programme, the first of its kind in the

UK, developed by National Instruments, combines face-to-face teaching with hands-on lab exercises, preparing students for their future careers by developing their skills in using the visual programming language LabVIEW created by National Instruments. <sup>44</sup> The LabVIEW academy is a great example of to deliver real CV-enhancing benefits to our students. It requires hard work and enjoyable for both students and staff. **Professor Martin Levesley** 



www.engineering.leeds.ac.uk/mechanical/undergraduate/learning-teaching

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### **Projects**

Projects provide an excellent opportunity to explore a subject further and enable you to develop essential skills such as problem solving, communication skills and teamwork which are all vital to success in your future career.

Unique to our courses is our subscription to the principles of CDIO (Conceive, Design, Implement and Operate). CDIO is an international initiative including universities from all over the world, which seeks to place the learning of engineering science in the context of what engineers actually do, expressed by the Conceiving – Designing – Implementing – Operating process. We believe the approach fosters a deeper knowledge of underlying fundamentals and helps students to relate abstract concepts to real-world problems.

As part of this initiative, you will have the opportunity to integrate the knowledge taught in engineering science modules through a series of challenging 'design and make' group projects. These projects are largely 'self-build', where students use tools to fabricate and assemble their systems. In the first year you will create 3D parts using computer software and have these parts manufactured by our manufacturing workshop. You will then assemble a gearbox with the resulting parts to test if they fit together in a perfect assembly.



You will design and build elastic powered buggies (or gliders for aerospace engineering students and bio-arms for medical engineering students) and use Nintendo Wii remotes to electronically capture your buggy's performance in the industry sponsored buggy competition.

You will build a cardboard bridge and use knowledge from modules on statics and computer analysis to predict when it will break, testing the accuracy of your predictions against measured performance.





In the second year you will take part in our flagship 'design and make' project, 'The Daring Dash', which is a world-class learning activity sponsored by National Instruments. The challenge is to build an autonomous electric powered buggy to travel over a bumpy course and stop on a bull's eye. The activity applies theory from modules of vibration and control and mechatronics. You will program a high specification embedded controller, design a suspension and chassis and select motors/drive train components, competing against your peers for a winning time, and a real cash prize!

In the waterwheel CDIO activity, your ability to apply theory from the thermofluids modules is tested by designing and building a microhydroelectricity generating device, which will then be tested to see if it spins and works as predicted in our water flume. The 'design and make' projects take place in some of our recently refurbished teaching laboratories, including the National Instruments Active Learning Laboratory and our Model Making Workshop. The Workshop has metalworking tools, as well as two 3D printers.

The School's engagement with industry is most evident in the fourth year team projects, which involve working closely with an industrial partner to deliver real engineering solutions. The collaborations ensure that in addition to developing individuals with excellent technical capabilities, our graduates are well versed in working in a professional environment and are ready to become future leaders in their chosen field.

Examples of current fourth year team projects are:

- Multidisciplinary Optimisation of Aircraft Engines, in collaboration with Rolls-Royce
- Conceptual Design of a Mars Return Vehicle, in collaboration with EADS- Astrium

Getting involved in such a project is excellent experience. It exposes you to the engineering processes involved in higher level motor sports skills you would need to use in Formula One. Every day as a race engineer I use the skills and techniques I learnt whilst studying at Leeds.

Andrew Shovlin, Mechanical Engineering 1995, Senior Race Engineer for Mercdes GP Petronas F1 team

#### Formula Student Race Team

You can become involved in the Formula Student race car project through work linked to your course. As well as encountering many real life challenges of working as a professional engineer, students involved in the project are also responsible for raising sponsorship, marketing the project and actually racing the car at competitions. It is also a great opportunity for students to demonstrate their abilities to future employers, in fact over 10 students from the School have been recruited into Formula One teams as a result of their involvement with the project.



## Enhancing Employability

All of our degrees are professionally orientated and will equip you with the skills you need to succeed in industry, including design, problem solving, numeracy and analysis skills, together with 'transferable skills'. such as communication and working as a team.

Careers in the field of mechanical engineering are wide-ranging and employment prospects are excellent.

According to the IMechE the average starting salary for a graduate Mechanical Engineer in the UK is £26,000, 87%\* of our graduates have either gone on to further study or have successfully secured employment. You will find many of our graduates working as Graduate Mechanical Engineers, Graduate Engineers, Nuclear Engineer, Design Engineers, Graduate Project Managers, Product Design Engineers for organisations such AMEC, BAE Systems, Thales, Jaguar Land Rover, Rolls-Royce, Cameron, Red-Bull Racing, Mars, Nestlé, Shell, and National Instruments to name a few.

#### **Strong Industrial Links**

A degree from the University of Leeds is a significant advantage in today's job market. Our graduates are able to take advantage of the wide range of industrial links and collaborations that have been developed over many years by the School of Mechanical Engineering.

The School's engagement with industry is evident in each year of study especially in the 4th year team projects, which involve working closely with an industrial partner to deliver real engineering solutions. The collaborations ensure that, in addition to developing graduates with excellent technical capabilities, our graduates are well versed in working in a professional environment and are ready to become future leaders in their chosen field.



The companies with which the School works range from major transnational organisations such as BP, Shell, National Instruments, Rolls-Royce to leading high technology companies such as Surgical Innovations, to name but a few. The School's strong industrial links is one of the many reasons why our graduates are highly sought after by employers. It also ensures that your course is industry orientated and that material is up to date. Our staff work with numerous companies on wide-ranging research and consultancy projects. We also organise a range of industrial visits and offer additional seminars delivered by practising engineers and other professionals. This means that you have direct contact with industry and potential employers from an early stage in your course.



In an increasingly competitive job market our degrees can give you the edge to help you stand out. We will help you to develop the knowledge and skills you need to succeed, plus plenty of extra opportunities outside of your studies to increase your chances of securing that all-important graduate job.

#### Summer Research Placement

Our research groups offer paid summer internships to work on research projects at the end of years 2 and 3. This gives you the opportunity to work with world-class academics on ground breaking technologies and allow you to experience the possibilities of following a research career at the end of your degree.

#### Placements

A placement year option allows you to spend time in industry with one of the hundreds of companies that the University works with each year and can help you gain the skills valued by employers, as well as developing enterprise skills.

#### International Corporate Leadership Programme (ICLP)

You can apply to undertake a work placement through the University's prestigious International Corporate Leadership Programme (ICLP), which is a collaboration between the University and a range of internationally based companies.

#### Study Abroad

The Study Abroad option is available on all of our engineering courses. You may choose to spend a year of your course (either the second or third year depending on whether you are going for the BEng or MEng degree) studying abroad at a university in Europe, North America or even the Far East. Increasingly valued by employers, this option provides you with a fantastic opportunity to experience life in another country and a different culture. If you have foreign language skills, ERASMUS exchanges are available to several European countries.

www.leeds.ac.uk/studyabroad

<sup>44</sup> My summer internships and year abroad different departments including the manufacturing staff and the Managing Director. The experience helped enhance My year abroad gave me the opportunity to work and live with people from all over cultures. The life experiences gained provide me with an excellent skill set that allows me to compete for the best jobs in the market. **Joe Thorogood,** Mechanical Engineering Graduate

#### **Careers Guidance**

The University of Leeds Careers Centre is one of the largest in the country. The Centre's services and experienced advisers can help you find work experience, improve your CV, guide you in possible career choices, and provide long-term support after you graduate. http://careerweb.leeds.ac.uk/

#### **Engineering and Computing Careers Fair**

Engineering and Computing Careers Fair which attracts over 30 graduate recruiters. Their graduate recruiters also visit the Faculty to deliver presentations and workshops specifically for our engineering and computing students.

#### Leeds for Life

Leeds for Life is about preparing our students for their future. It's about inspiring them to get the most out of their academic and co-curricular experiences and build on their time studying at the University of Leeds

#### www.leeds.ac.uk/leedsforlife

www.engineering.leeds.ac.uk/mechanical/undergraduate/employability

### **Research-based Teaching**



As research is at the heart of all of our degree courses, you will have the opportunity to learn about and take part in the research process. This is just one example from the School where the aim is for staff and students alike to deliver high-quality research to solve real-world problems.

As part of a final year research project undergraduate students from the School developed a surgical technology offering real benefits to surgeons operating at a distance during "keyhole" surgery.

The technology combines a computer-generated environment for virtual surgery and a hand-held device that applies pressure to the user's hand. What the user feels will depend on how hard they are compressing the virtual tissue.

The system could help cancer surgeons who like to feel the tissue they are cutting out – an important way of double-checking where the tumour is and if it is malignant or benign.

Keyhole surgery, in which surgeons operate through tiny incisions, has many benefits for patients. It reduces the chance of complications, shortens hospital stays and speeds up recovery times

But at the moment, surgeons who work 'through the keyhole' cannot feel the tissue they are operating on, as they would during open surgery. This means they are unable to tell the character of a suspicious lump - an important way of diagnosing cancer.

The team of students set up the system to simulate keyhole surgery on the liver. They gathered measurements from a soft block of silicon to simulate what surgeons would 'feel' during keyhole procedures and fed these into their hand-held device. They tested the system by embedding hard ball-bearings in the artificial, silicon liver and checking whether users could find them.

"This system might help surgeons to become more accurate in theatre," said engineering student, Earle Jamieson. "Haptic devices that give users sensory feedback are becoming more common in surgery, but none of them quite match that true hands-on feeling. With our system, users can interact with the tissue they are operating on throughout the surgical procedure."

"Judging from the feedback the students have received from practising surgeons, this system has real, clinical potential," said Dr Peter Culmer, a Senior Translational Research Fellow in Surgical Technologies, who supervised the work. "In the short-term, it could be used as a training tool to help surgeons get a feel for keyhole surgery – quite literally. Looking further ahead, systems such as this could become used in operating theatres on a daily basis."

After graduating last summer both James and Earle have continued their research here in the School undertaking a PhD.



Aeronautical and Aerospace Engineering (MEng, BEng) UCAS CODE H410

Aeronautical and Aerospace Engineering is one of the most challenging and demanding of all engineering disciplines. You will learn how to integrate mathematics, physics, materials and computer science together with a strong design philosophy to allow you to design, analyse, manufacture and operate aircraft and aerospace vehicles.

Due to the complex nature of aircraft and aerospace design, manufacture, control, aerodynamics and structural analysis, the course has a strong mathematical foundation. This course is jointly accredited by the Institution of Mechanical Engineers (IMechE) and the Royal Aeronautical Society (RAeS), which means that once graduated you can go on to achieve Chartered Engineer status (CEng).

When you graduate from this course you will be able to apply your skills in a number of areas including fundamental research, airline management and operations, satellite operations and aerospace design and manufacturing in both the civil and military environments. The global aerospace industry also drives many future developments in science and technology. At Leeds you will be taught by academics with a passion for aeronautical and aerospace engineering who are at the forefront of the field. Some of their strengths and expertise include aircraft structural analysis (making certain that the aircraft is strong enough), structural optimisation (making best use of materials), aerodynamics and computational fluid dynamics (minimising drag and increasing fuel economy) and aircraft stability and control



chose Leeds because of its excellent Engineering. The course particularly emphasis on project work. I believe that develop skills but also so many important interpersonal skills such as teamwork, problem solving, communication and timemanagement that are essential to succeed in industry.

James, Aeronautical and Aerospace Engineering

#### **Student Project Examples**

- Development of a short take-off and landing air ambulance
- Development of a transport aircraft with detachable cargo bay
- Implementing a strain gauge balance within a wind-tunnel
- An experimental study into the formation of ice on aircraft wings (the cause of many accidents)

#### Graduate Destinations

- Aerospace Engineer, Morson Projects
- Assistant Engineer, Cyberflight
- Engineer, British Aerospace, Preston
- Graduate Engineer, BAE Systems
- Graduate Engineer, Thales
- Graduate Mechanical Engineer, Alstec Ltd
- Mass Properties Engineer, Agusta Westland Helicopters
- Product Design Engineer, Cameron
- Officer Cadet. RAF
- Weapons Systems Officer, Royal Air Force, RAF College

### Automotive Engineering is concerned with the life-cycle support (including design, manufacture, performance and durability testing) of vehicles; from road and off-road vehicles to race cars, vans and trucks.

A key challenge for Automotive Engineers today is to design sustainable vehicles that meet ever-increasing safety and performance standards in a cost-effective way. In order to do this, you need to be able to embrace a wide range of fundamental and more specialist engineering skills, as well as being aware of the commercial implications that impinge on the design and production processes.

There is also the opportunity to work on the Formula Student Car, which is a big attraction for this course, as well as providing you with an excellent chance to put theory into practice.

The course is accredited by the Institution of Mechanical Engineers (IMechE) enabling graduates to go on to achieve Chartered Engineer status (CEng).





Due to the School's excellent reputation and links with industry, our graduates are actively recruited by a wide range of prestigious companies within the automotive sector, including manufacturers such as Ford and BMW, design/consultancy organisations such as Ricardo and Leyland Technical Centre and even Formula One teams such as Honda Racing and Renault F1.

#### **Student Projects**

- Innovative design of brake rotors using plasma electrolytic oxidised aluminium material
- Computational fluid dynamics analysis of the SAE race car
- Determining friction loss and wear within an engine
- The design and build of the SAE race car

#### Graduate Destinations

- Building Services Engineer, Building Design Partnership
  Graduate Engineer, Jaguar Land Rover
- Design Engineer, UV Modular
- Engineer, Construction Firm
- Engineering Research
  Graduate Engineer, Network Rail

### chose Leeds because of its excellent

been to a number of Open Days at other universities, but Leeds really made a lasting impression. I was particularly impressed by car as part of my final year project.

**Chris,** Automotive Engineering

### Mechanical Engineering (MEng, BEng) UCAS CODE H300

Mechanical Engineering is perhaps the broadest of all engineering disciplines. Mechanical Engineers have a vast impact on modern living, working to make continual improvements to the everyday things we have come to take for granted.

Mechanical Engineers help shape the way we live through the design and manufacture of everyday items from sports equipment to high-tech operating theatres for hospitals, or industrial applications such as the structural design of oil platforms. A wide range of skills are needed to achieve this in an efficient. environmentally-friendly and sustainable way.

The course is accredited by the Institution of Mechanical Engineers (IMechE) enabling graduates to go on to achieve Chartered Engineer status (CEng). The University of Leeds has a long history of excellence in Mechanical Engineering and our degrees give you a broad base of knowledge which can be applied to a wide range of mechanical engineering-related industries. You will also gain excellent transferable skills such as team working, logical thinking and project management which will provide you with wide ranging opportunities in the job market.





Mechanical Engineers from Leeds can be found working all round the world, from running oil platforms to working on automation and robotics, to designing futuristic buildings and working in the manufacturing industry.

#### **Student Projects**

- · Optimising the aerodynamics and engineering materials of bicvcle frames
- Drag reduction of objects through the use of artificial sharkskin
- The testing of body armour
- Developing a model of micro-renewable energy production

#### **Graduate Destinations**

- Control Systems Engineer, Kemira Chemicals
- Design Analysis Engineer, Bentley Motors
- Design Engineer, Msports
- Graduate Engineer, Automotive Engineering Company
- Graduate Engineer, Mars

The projects are the part of the course that I enjoy the most. Designing and building an elastic band powered buggy in my first year was great fun and it was also a great chance to compete against my peers. My individual project is to design a temperature control for a Thermal Manikin which allows me to do research into the area and also gives me experience at running my own project.

Sarah, Mechanical Engineering

#### Mechanical with Nuclear Engineering (MEng, BEng) UCAS CODE H3H8

With the current need to reduce emissions that can lead to climate change, and the ever increasing demand for energy, nuclear power is seen as an essential element of our global portfolio of energy production technologies.

There is a resurgence in the demand for mechanical engineers with specialist knowledge of the requirements of the nuclear industry. This programme provides you with such knowledge.

It is based solidly on the foundations of Mechanical Engineering followed by more specialist topics relating directly to the nuclear power industry. Project work is an important feature of the course as it develops essential skills required to succeed in industry, and gives you the opportunity to demonstrate your imagination and flai

Graduate Destination Examples

Leeds graduates are actively recruited by a wide range of prestigious companies. As an engineer in the nuclear industry, you might be responsible for designing the next generation of nuclear power plant, be required to run a nuclear power station safely and productively, or you may be involved in fuel reprocessing, waste management, decommissioning of old nuclear power stations or radiological protection and safety.

Accreditation is being sought from the Institution of Mechanical Engineers (IMechE), which will help you gain Chartered Engineer status (CEng) after graduation. Summer placement opportunities through our International Corporate Leadership Programme and year-long exchange programmes are also available.

This is an integrated MEng, BEng course which means there is only one UCAS code to use for both options. This allows you the most flexibility as you progress through your education; you can choose to follow the full 4 year route to an MEng degree, or

www.engineering.leeds.ac.uk/speme/undergraduate



Medical Engineering is a multidisciplinary field that addresses the needs of the healthcare community and advances patient care by bringing together knowledge of engineering science, biological science and medicine.

Biomedical engineers are called upon to use their knowledge to design replacement parts for our bodies, for example artificial hip joints, which require engineering expertise to ensure the replacement does not wear out, and biological knowledge to ensure the human body does not reject the implant.

Other areas include using engineering knowledge to better understand the body so that new and innovative diagnostic tools can be developed for the medical community. Future developments in biomedical engineering will bring us closer to the biological sciences where bioengineers will 'engineer' a device from living cells and organisms.

The School has an international reputation for its expertise in the field of Medical Engineering and is part of the Leeds Institute of Medical and Biological Engineering which acts as a focus for training and research in hospitals and at the University. This ensures that our course remains at the cutting edge of this fast moving field. The degree is accredited by the Institution of Mechanical Engineers (IMechE) enabling graduates to go on to achieve Chartered Engineer status (CEng).





**12** UNDERGRADUATE DEGREES



those interests. I chose to study at Leeds due to the University's status as a whole department.

Jake, Medical Engineering

#### **Student Project Examples**

- Determining the stresses generated within the tailbone during snowboarding falls
- The dynamics of cement flow within bone used to fix artificial joints
- Developing safe robots connected directly to humans
- The mechanics of spinal cord injury

#### **Graduate Destinations**

Our Medical Engineering graduates are highly sought after by many prestigious companies such as DePuy, Johnson & Johnson and Howmedica. A degree in Medical Engineering opens up career opportunities in a wide range of fields. Some of our recent graduates can be found working as:

- Manufacturing Engineer (Medical Devices), Sandvik,
- Knee Product manager, Corin
- Defence Engineer, Babcock
- Trainee Clinical Scientist
- R&D Test Engineer, DePuy International Ltd
- PhD Wear Simulation of Lumbar Total Disc Replacements iMBE, University of Leeds

## **Course Structure**

The first and second years of your studies are broadly common; it is in your third and fourth years where your options really begin to open up. A choice of modules means that you can tailor the course to reflect your interests and career plans.

### Year 1

- Core Modules
- Engineering Materials
- Solid MechanicsDesign and Manufacture 1
- Thermofluids 1
- Engineering Mathematics
- Computers in Engineering Analysis

#### Year 2

#### **Core Modules**

- Thermofluids 2
- Engineering Mechanics
- Vibration and Control
- Design and Manufacture 2
- Economics and Management
- Mechatronics and Measurement Systems

#### Year 3

#### Aeronautical and Aerospace Engineering

- Compulsory modules:
- Professional Skills
- Individual Project
- Aerospace Vehicle Design
- Aerodynamics with Computational Fluid Dynamics
- Structural Mechanics
- Elements of Propulsion

### Aerospace Flight Mechanics

#### Mechanical Engineering Compulsory modules

- Compulsory modules:
- Professional Skills
- Individual Project
- Thermofluids 3
- Design and Manufacture Systems
- Finite Element Methods of Analysis

#### **Optional modules:**

- International Corporate Leadership 2
- Vehicle Design and Analysis

**14** UNDERGRADUATE DEGREES

- Aerodynamics with Computational Fluid Dynamics
- Biomedical Engineering

#### Programme Specific Materials through:

- Tutorials
- Project Work
- Examples Within Core Modules

#### Programme Specific Materials through:

- Tutorials
- Project Work
- Examples Within Core Modules

#### Mechanical with Nuclear Engineering Compulsory modules:

- Professional Skills
- Individual Project
- Thermofluids 3
- Finite Element Methods of Analysis
- Nuclear Fundamentals
- Nuclear Operations

#### Automotive Engineering

- Compulsory modules:
- Professional Skills
- Individual Project
- Vehicle Design and Analysis
- Thermofluids 3
- Finite Element Methods of Analysis

#### **Optional modules:**

- International Corporate Leadership 2
- Aerodynamics with Computational Fluid Dynamics
- Design and Manufacture Systems

#### Year 3 continued

#### Medical Engineering

#### Compulsory modules:

- Professional Skills
- Individual Project
- Biomedical Engineering Simulation
- Biomedical Engineering
- Finite Element Methods of Analysis
- Biomaterials and Tissue Engineering

#### **Optional modules:**

- International Corporate Leadership 2
- Aerodynamics with Computational Fluid Dynamics
- Design and Manufacture Systems

#### Year 4

Aeronautical and Aerospace Engineering Compulsory modules:

- Team Project
- Design Optimisation MEng
- Aerospace Structures
- Rotary Wing Aircraft
- Aerospace Systems and Propulsion

#### **Medical Engineering**

- Compulsory modules:
- Team Project

#### **Optional modules:**

- Design Optimisation MEng
- International Corporate Leadership II
- Mechatronics and Robotics Applications
- Combustion in Engines
- Surface Engineering
- Energy Systems Engineering
- Biotribology (Distance Learning)
- Biomaterials (Short Course)

• Introduction to Tribology

Aerospace StructuresRotary Wing Aircraft

- Functional Joint Replacement Technology (Short Course)
- Computational and Experimental Methods

• Aerospace Systems and Propulsion

#### Automotive Engineering Compulsory modules:

• Team Project

#### **Optional modules:**

- International Corporate Leadership II
- Mechatronics and Robotics Applications
- Automotive Chassis Engineering
- Automotive Driveline Engineering
- Combustion in Engines
- Computational and Experimental Methods
- Introduction to Tribology

#### **Medical Engineering**

#### Compulsory modules:

• Team Project

#### **Optional modules:**

- Spinal Biomechanics and Instrumentation
- Biotribology
- Biomaterials
- Functional Joint Replacement Technology
- Computational and Experimental Methods
- Tissue Engineering

#### Mechanical with Nuclear Engineering

- Compulsory modules:
- Team Project
- Nuclear Engineering and the Nuclear Industry
- Nuclear Futures

#### **Optional modules:**

- Mechatronics and Robotics Applications
- Computational and Experimental Methods

The module table indicates the range of topics students may study. It is important to note that the availability of some options in later years will be determined by earlier choices. We also regularly review the structure, content and assessment of our courses and may vary them from time to time in the light of experience and new developments.

### Entry Requirements and How to Apply

All undergraduate applications should be made through the Universities and **Colleges Admissions Service (UCAS).** Full instructions on how to apply are available at www.ucas.com

#### Equivalent Qualifications

The majority of applicants apply with GCE A-levels, although a wide range of alternative UK qualifications are welcomed. For more information visit:

www.engineering.leeds.ac.uk/alternative-uk-qualifications

#### International Students

We have many international students and we make offers with reference to most recognised national and international qualifications on an individual basis. For information about our entry requirements for your country you can visit:

www.engineering.leeds.ac.uk/equivalent-qualifications

We also offer a number of competitive scholarships to students from outside the UK and European Union.

If you have any queries about entry requirements please contact the Undergraduate Admissions Team ugmech@leeds.ac.uk

#### English Language Requirements

If English is not your first language, you will need a recognised English Language qualification for example IELTS (6.0 overall with at least 5.5 in each component of listening, reading, speaking and writing) or TOEFL (87 overall with no less than 21 in listening, 22 in reading, 23 in speaking and 21 in writing).

#### Language Centre

The University's Language Centre offers several courses to help international students improve their English language skills. If you have not yet reached the University's English requirement you can take the Pathway English Language Programme, intended specifically for those who are applying for, or planning to apply for, an undergraduate degree, but who need to improve their level of English to meet the University's requirements.

There is also a Pre-Sessional Programme for students who have fulfilled the English requirement but would like to improve their academic language skills before starting their degree. www.leeds.ac.uk/homepage/249/language\_centre

#### Foundation Year for International Students

The University of Leeds also offers a Foundation Year for international students in Engineering, which can provide an alternative entry to our degree courses. This one-year course is available to international students with a background equivalent to AS-level, for example the School Leaving Certificate. http://internationalfoundationvear.leeds.ac.uk

#### Foundation Course (CFG0)

Students who do not have the required gualifications for year 1 entry may be interested in the Interdisciplinary Science Foundation Programme, which consists of an initial year of mathematics and science designed to equip students with the broad range of basic skills needed to embark on an engineering course. Once students have successfully completed the Foundation Programme they can progress onto the first year (year 1) of their degree course.

www.llc.leeds.ac.uk/courses/interdisciplinary-science-foundation

#### Scholarships

We are committed to challenging and supporting our students and to recognising hard work and achievement. There are a range of scholarships available for UK, EU and international students.

www.engineering.leeds.ac.uk/scholarships

Course	UCAS Code	A Level Requirement
Aeronautical and Aerospace Engineering (MEng/BEng)	H410	AAA including Mathematics and Physics
Automotive Engineering	H330	AAA including Mathematics (and preferably physics)
Mechanical Engineering	H300	
Mechanical with Nuclear Engineering	HHH6	
Medical Engineering	H3H8	

### Coming to Leeds



#### Visit Us

Open Days are a great opportunity to visit the University and to get a feel for what it will be like to study here before you apply. There are general University Open Days in June and October.

#### www.leeds.ac.uk/visitus

#### After Application

Once your UCAS form has reached our Undergraduate Admissions Team, and if we make you an offer, you will be invited to visit the Located at the heart of the UK, Leeds is midway between School where you will meet both staff and students informally. A Edinburgh and London making it an ideal centre from which to firm favourite of the Open Day is a short design and make activity, visit other parts of the country. Leeds can be reached easily by where prospective students get to work in small teams to put into train from any part of the UK, and is served by Leeds/Bradford practice the engineering design cycle that will be described during International Airport, with train connections from Manchester and the day. It's a great opportunity for you to experience some of the London International Airports. challenges facing engineers first hand. In addition to this, you will get to tour the School and campus, see some demonstrations, and get a feel for the place as a whole.

#### Accommodation

We know how important finding the right accommodation is, so the University guarantees accommodation for all first year single undergraduates who apply before July of the year of entry. More information about University accommodation, viewing days and how to apply is available on our accommodation office website, visit: www.leeds.ac.uk/accommodation

#### University of Leeds

The University of Leeds is one of the UK's top universities. Our degrees are well respected by employers and Universities worldwide; in the 2010 QS World University Rankings, our Employer Review score was 88%.

Established in 1904, we are part of the prestigious Russell Group - the 20 leading research universities in the UK. We are also in More Information the top ten UK research intensive universities. We have performed If you require further detailed information, are uncertain about consistently well in the National Student Survey. In fact, in the your qualifications or if you have special needs, please contact the latest survey, 86% of students said they were very satisfied or Admissions Team prior to making a formal application. satisfied with their experience at Leeds.

Our single-site campus is conveniently located a short 10 minute walk to the city centre, providing access to a vibrant city life and excellent local services and facilities.

We have more than 5,000 undergraduate students from outside the UK who choose to study at Leeds and make use of our

outstanding facilities, including a major academic research library, laboratories and computing facilities.

Located at the heart of our campus is our award-winning Students' Union which has over 31,000 members. Clubs and societies form an essential part of the Union, with over 300 to choose from including everything from national groups such as the Chinese Society, faith and cultural societies to extreme sports and the performing arts. Also located on campus is our flagship state-ofthe-art fitness, sport and wellbeing facility - The Edge.

#### City Life

Leeds is a fantastic place to live and learn: it's a multi-cultural and cosmopolitan city with over 200,000 students, all enjoying the safe, friendly environment.

Leeds is renowned as a major shopping destination and centre for entertainment, nightlife, the arts and leisure. The city boasts over two miles of traffic-free shopping and beautiful Victorian and Edwardian arcades filled with shops of every kind. The city also offers an extensive choice of places to eat and drink whatever your culinary tastes or budgets. Nightlife in and around the city is known for its diversity and popularity, and offers a range of music to suit all tastes.



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