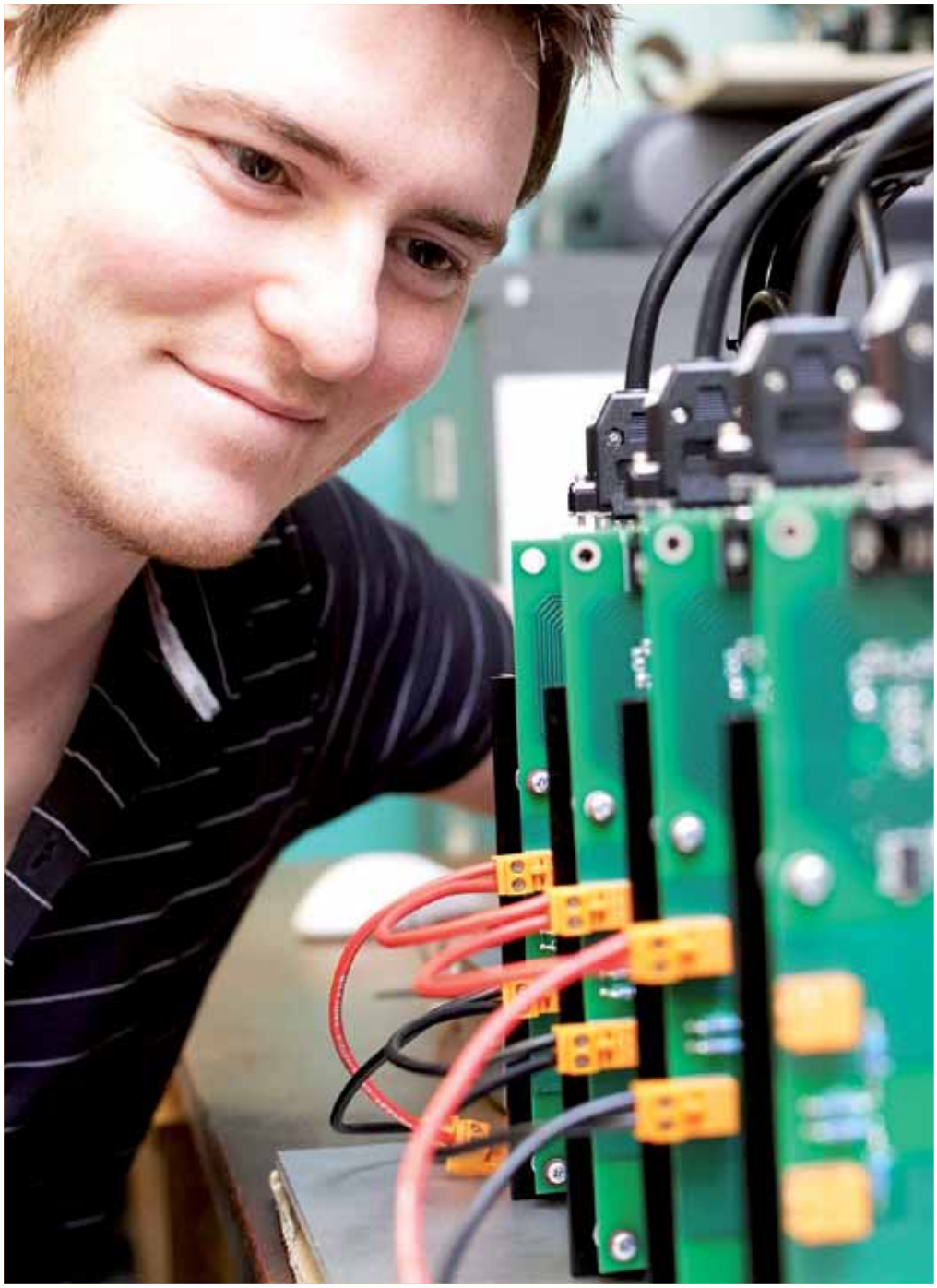
School of Electronic and Electrical Engineering

FACULTY OF ENGINEERING

UNIVERSITY OF LEEDS

Undergraduate
Degree Courses 2013



Contents

School of Electronic and Electrical Engineering

The global electronics industry is vast. In the UK alone it is an extremely diversified, multi-billion pound industry made up of a range of companies from large multinationals to a whole host of start-up companies all working on the next generation of technology.

Electronics is so ubiquitous in modern life that there are many opportunities for electronic engineering graduates to apply their expertise in other industry sectors. Business, medicine, aviation, communications, transport, space exploration, industrial automation, crime prevention, science, entertainment, music, gaming and environmental monitoring have all been revolutionised by electronics.

Did you know that, for example, 30% of the value of a modern car lies in its electronic systems and a typical family car has as many as 70 embedded processors? Electronic engineering, with unequivocal commercial significance and with a growing impact on almost every walk of modern life, is also a broad and vibrant multidisciplinary academic field. This is particularly the case at Leeds, where our teaching and research draws upon a range of other disciplines such as Music, Mechanical Engineering, Computing and Product Design. It is this broad range of experience that makes our graduates especially valuable in both industry and academia.

www.engineering.leeds.ac.uk/electronic

Learning and Teaching

The field of electronic and electrical engineering is exceptionally dynamic and technological change is rapid. Our ground breaking research is an important feature of our courses and 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.

When you start your course you will receive a welcome pack to support your academic studies and project work. This study support package includes tools, development kits, student versions of a range of industry-standard commercial software, electronic components and access to hundreds of e-books.

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 and project work 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 semester, and through tests, coursework and laboratory reports in the form of projects, presentations and posters.

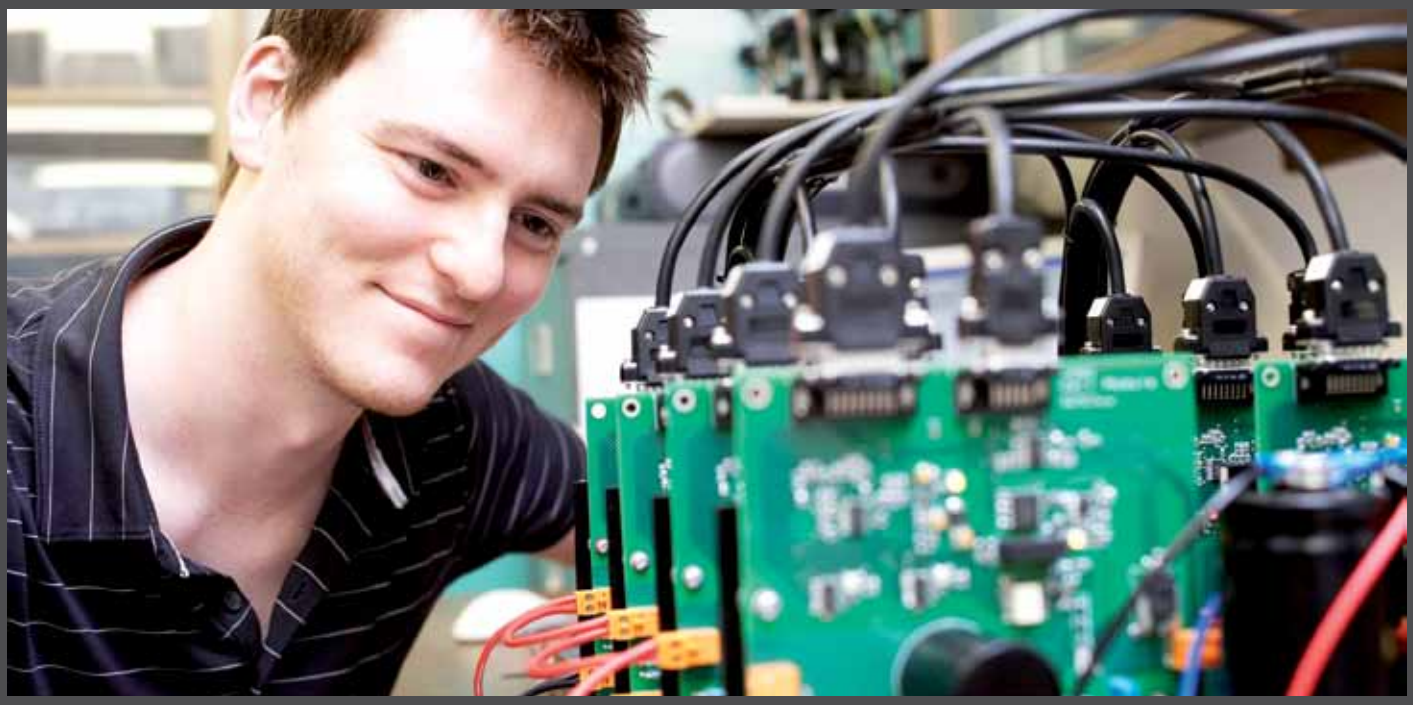
Our personal tutorial system will help you to integrate quickly and settle down easily into university life. You will be assigned to a tutorial group and you'll have one-to-one time with your personal tutor. The School has excellent student support – student support teams are located close to where you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

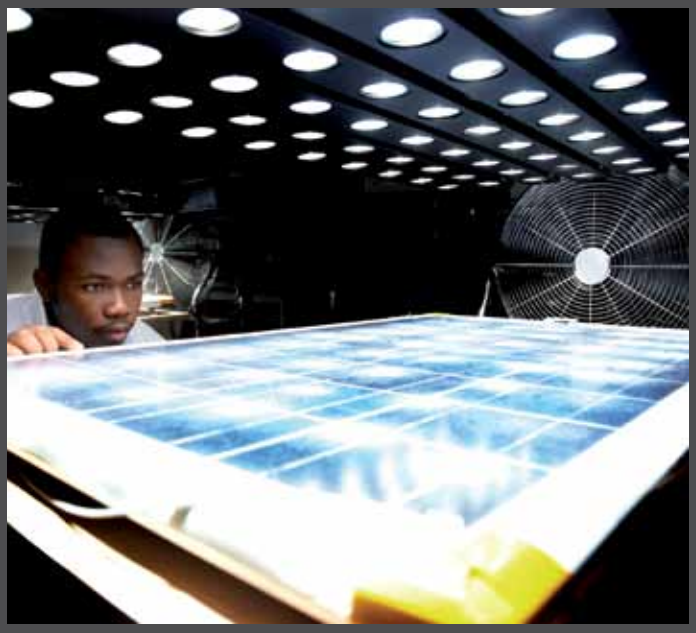
Facilities

You will have access to excellent teaching facilities including multi-million pound research laboratories equipped with the latest technology, to give you a creative and stimulating learning environment. For example the embedded systems laboratory equipped with the latest embedded systems development tools sponsored by Farnell, the Agilent Technologies Wireless Communications Laboratory, equipped with the very latest state-of-the-art electronic teaching equipment comprising of Agilent's bench top spectrum analysers, signal generators and 6000 series Scopes. You will also have the opportunity to work on communications systems up to 3 GHz and use the Agilent's leading edge Vector Signal Analysis software package for learning about modern standards such as Zigbee, WiMAX, GSM and WiFi.

You will also have access to a range of research facilities for your final year projects, such as the best Terahertz Electronics facility in Europe and a cleanroom for nanotechnology research. You'll also enjoy excellent teaching facilities and resources, with modern, well-equipped lecture theatres.

The School is also home to one of the most high-resolution electron-beam lithography systems in Europe.





Projects

Projects are an important feature of all of our courses, they provide an excellent opportunity for you 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 chosen career.

Our close links with industry means that you will benefit from industrial input into design projects at a variety of levels, from setting projects through to more direct involvement in discussions and consultancy and arranging plant visits.

In your first year you will be involved in working in a team to design, build and test an autonomous robot or radio-controlled tank to steer around a track. The project ends in a competition to see which team has the fastest, longest running or most fun design.

In your second year, the project focuses on programming and will include an iPhone application and a microcontroller-based embedded system design.

If you are an electronics student you can choose a project from any theme you like, whilst mechatronics students select a project from the Robotics theme and Music, Multimedia and Electronics take a music theme. A typical project might be to design a microcontroller-based music synthesiser, a hand-held game, or a robotic arm using an embedded control system.

In the third year you will undertake either an individual project (BEng students) or a group project (MEng students) that is in a specialist topic area related to your chosen degree.

In your fourth year of the Electronic and Electrical Engineering programmes (MEng) you will undertake an individual project. For MEng students the Group Design Project is a key requirement for the accreditation of the degree, and so required for Chartered Engineer status. As a team you will define the project requirements, divide the work and generate a detailed time plan of events and critical milestones. As well as being technically challenging, these MEng projects encourage team working skills and facilitate the development of a strong group identity.

Integrated Masters

All of our degrees are Integrated Masters (MEng, BEng) with the exception of our BSc Music, Mutlimedia and Electronics degree course, 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 which fulfils all of the necessary academic requirements on the route to Chartered Engineer status, the full preferred engineering qualification.

If you choose to do an Integrated Masters you will have the opportunity to work on a greater range of project work, including group work. As a result of our strong industrial links the individual or group 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.

> “My final year project was to design a receiver board for an ultrasound research platform for the Ultrasound Research Group at Leeds. It involved researching what the system needed to have, designing the circuit boards on a computer, and sending them off to be manufactured. It was a lot of hard work but exciting to be trusted with such a large (and expensive!) project. The system is now being used to investigate several new ideas, such as the potential to use ultrasound for drug delivery, for example in treatments for cancer.”
>
> **Paul,**
> MEng Electronic Engineering

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

Enhancing Employability

All of our degree courses are professionally orientated, you can be sure that what you learn is up to date with employers' needs. Our degrees will also help you to develop skills that you need to succeed in industry, including design, problem solving, engineering ethics, numeracy and analysis skills, together with 'transferable skills', such as communication and working as a team.

Careers in the field of Electronic and Electrical Engineering are wide-ranging and employment prospects are excellent. Because of the nature of the electronics industry the demand for high calibre electronic engineering graduates is high and employment opportunities exist both in large multinational corporations and small startup companies working on next-generation products and technologies.

86%* of recent graduates have successfully secured positions with organisations or have gone on to further study. You will find many of our graduates working for organisations such as ARM Ltd, Sharp, Sony, BAE Systems, Pace, Filtronic, BNFL, AEAT Rail, Ford and the BBC.

Salaries vary from company to company, with some sectors attracting higher salaries due to demand. However typical starting salaries for newly graduated electrical/electronics engineers are in the range of £18,000 - £29,000 with professionally qualified electronics engineers earning between £35,000 and £45,000**

Strong Industrial Links

The School of Electronic and Electrical Engineering has close links with some of the top recruiters in the industry, including Agilent Technologies, ARM, BAE Systems, Boeing, Bombardier Transportation, BP, BT, CCL, Cisco, Ericsson, ESA, Filtronic, Freescale, Fujitsu, GSK, IBM, Intel, Johnson Matthey, Micromech, Motorola, Nexia Solutions, O2, Pace Micro, QinetiQ, SET, Siemens, Sony, Telecordia, TeraView and Total Motion Controls Ltd.

The School's strong industrial links is one of the many reasons why Leeds Electronic and Electrical Engineering 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. Here are just a few examples of the School's strong links with industry.

- Building on long established links with local company Filtronic, we are developing additional links in the areas of energy systems and embedded systems with companies such as ARM and Imagination Technologies.
- Agilent Technologies Wireless Communications Laboratory, equipped with the latest state-of-the-art electronic teaching equipment including Agilent's bench top spectrum analysers, signal generators and 6000 Scope.
- Our new embedded systems laboratory is equipped with the latest embedded system development tools, sponsored by Farnell (Element - 14).
- Farnell has also sponsored the development of a new level 4 module Electronics Industry Dissertation.
- Many companies offer prizes, bursaries and scholarships and are also keen to recruit our graduates for vacation work or after graduation.

*2010/11 DLHE Survey for the Faculty of Engineering

**Prospects

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.

Industrial Placements

All of our courses allow you to undertake work experience as part of your degree in the form of a 12 month industrial placement, or shorter project work and summer internships which will help you develop essential employability 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 between your second and third year of the BEng or between your third and fourth year of the MEng degree course) 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

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

> "I did a work experience placement at Datong near Leeds - it's high security because they make covert tracking devices for the police and government agencies. I wanted to undertake a work placement as it's important to build up experience for your CV. Engineering opens many doors - so after graduation I've got a lot of options."
>
> **Jonathan Wilson,**
> MEng Electronic and Electrical Engineering
> (*pictured left during his placement at Datong*)

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

Electronic Engineering (MEng, BEng) UCAS CODE H610
Electronic and Electrical Engineering (MEng, BEng) UCAS CODE H600
Electronic and Communications Engineering (MEng, BEng) UCAS CODE H640

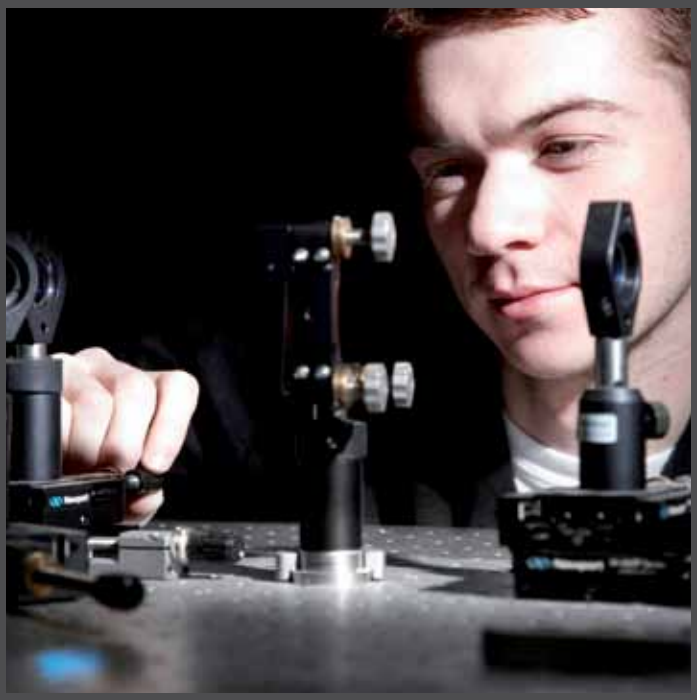
These three courses offer a broad foundation in modern electronic engineering combined with a range of specialist options for students aiming for careers in the rapidly expanding areas of information technology, computer networks, communications systems, embedded systems and renewable energy.

During the first two years you will develop a sound grounding of the underlying engineering, scientific and mathematical principles across the whole of the discipline, and see how they are applied in practice. In the third and fourth years, you can specialise in areas that interest you by choosing optional modules delivered by staff who are internationally recognised for research in their fields. It is this choice of options that determines the final degree title, so you can change between these three degrees right up until the end of the second year, providing you with greater flexibility and allowing you the opportunity to sample different topics before the choice is made.

All of these core degrees also have year abroad and industrial placement variants that are recognised in the degree title; these opportunities provide you with an important differentiator when applying for jobs. In your final year you can choose from a very wide range of modules that are also offered as part of our MSc programmes at Leeds.

These degrees are also accredited by the IET (Institution of Engineering and Technology). The MEng version of the courses meets all of the educational requirements for registration as a UK Chartered Engineer (CEng). Graduates of the BEng schemes can achieve this with additional study.

> "Electronic Engineering gives you a good overall foundation and offers you a variety of career options when you graduate. Electronic Engineering gives undergraduates the ability to be innovative and creative in revolutionary areas of technology."
>
> **Daniel, UK,**
> MEng Electronic Engineering



Electronic Engineering
This course allows you to specialise in advanced electronic design, including system-on-chip design, embedded systems engineering, high frequency and microwave engineering (as used in mobile communications links) and integrated circuit design and layout. As well as these core modules, the course offers you a wide choice of options such as optoelectronics, communications systems and electric drives. This programme is suited to those wishing to pursue a career in the embedded systems and digital electronics industries.

Electronic and Electrical Engineering
This course provides you with the opportunity to explore specialist areas such as power systems, control and energy conversion. This leads to careers in areas as diverse as renewable energy systems, power generation, electrical machines (such as the switched reluctance motor pioneered here in Leeds), industrial control systems (e.g. for automotive assembly), power electronics and electric drive systems (e.g. for hybrid petrol electric vehicles).

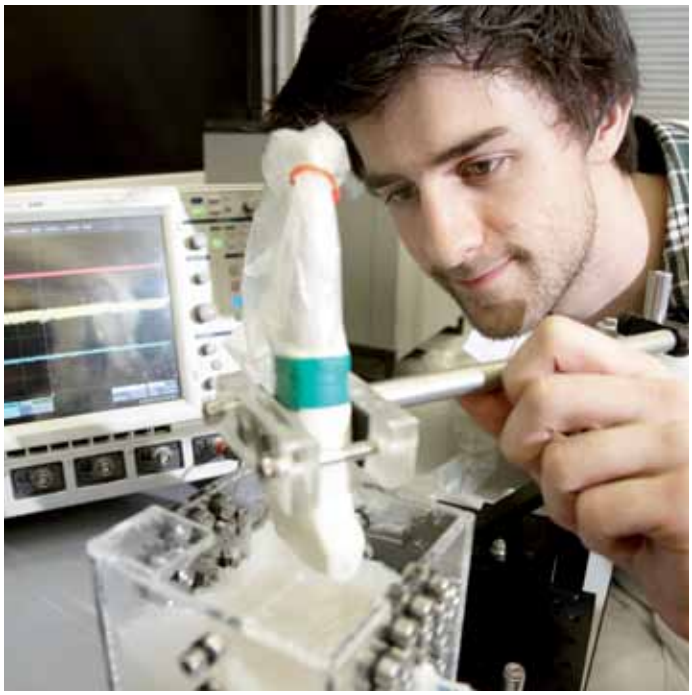
Electronic and Communications Engineering
If you are looking for a career in the field of communications systems, then this course is for you. This field includes mobile phone handsets and networks, data communications and digital broadcasting. This continues to be one of the fastest growing engineering sectors and one where the UK is particularly successful. The fourth year options for this programme are drawn from our highly successful MSc programmes in Communications.

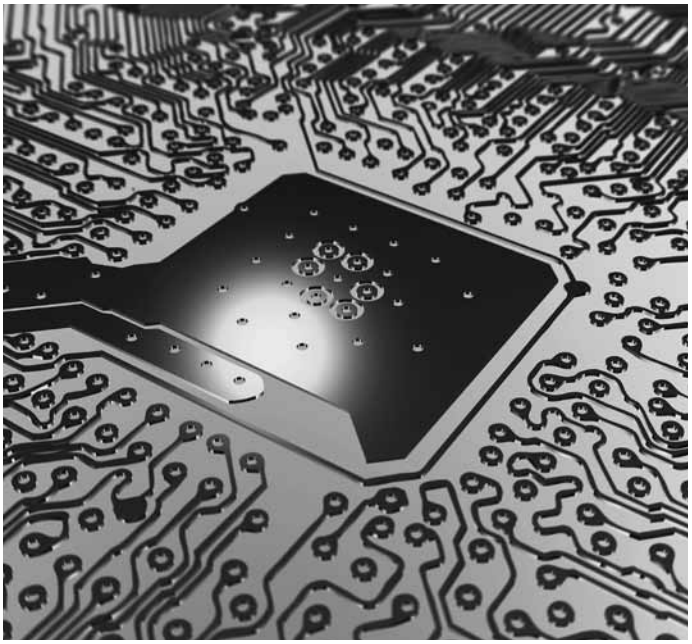
Student Projects

- Car security systems
- Robotics for volcanic exploration
- Mechatronic modelling of the spinal column
- Test equipment for tunnel radio propagation
- Climbing robots
- Electronic guitar tuners
- Application of Terahertz time domain spectroscopy
- Electronic golf scorecards
- Wireless network security and infrared letter scanners
- Wireless Braille interpreters
- Analogue mixing desks
- OFDM for 4H mobile communication
- An intelligent PIC controlled small vehicle
- Wireless personal property locators.

Careers

Recent graduates have been employed by companies such as ARM Ltd, Sharp, British Aerospace, Pace Microtechnology, Filtronic, BNFL, AEAT Rail, Rover, Baldwin Boxall Communications, CAT (Electronics) and the BBC. Opportunities exist both in large multi-national corporations and small startup companies working on next-generation technologies. For those who wish to specialise, or who want a career in research, postgraduate study is a popular option.





"You can really feel the benefit of being taught in a research-based environment – it's one of the reasons I was drawn to Leeds. The environment really affects my course – it's cutting edge. Most of my professors are widely known in their field – they are at the forefront of their disciplines so it's an honour to study here. Last year I was on the Dean's list which led to a two month scholarship at Toyota in Japan. I enjoyed learning about a different culture and having the chance to work on actual design projects."

Tomide Adesanmi, Nigeria,
MEng Electronic and Electrical Engineering

Course Structure

Electronic Engineering, Electronic and Electrical Engineering, Electronic and Communications Engineering

Year 1

- Circuit Analysis and Design
- Analytical Techniques
- Electronic Materials and Devices
- Fundamentals of Electrical Engineering
- Communications Systems
- Digital Electronics and Microcontrollers

Year 2

- High Frequency Circuits and Systems
- Communications Theory
- Transistors and Optoelectronic Devices
- Embedded Systems Project
- Energy Systems and Control Engineering
- Mobile Applications Project

Year 3

Electronic Engineering:
- Embedded Systems
- Semiconductor Technology
- RF and Microwave Engineering
- Digital Media Engineering Systems

Electronic and Electrical Engineering:
- Embedded Systems
- Electric Drive Systems
- Semiconductor Technology
- RF and Microwave Engineering
- Digital Communications

Electronic and Communications Engineering:
- Digital Media Engineering

Year 4 (MEng)		
Shared modules: • Individual Project		
Electronic Engineering: **Compulsory modules:** • Electronics Industry Dissertation **Optional modules:** • Digital Signal Processing for Communications • DSP Hardware Implementation • Data Communications and Sensor Networks • Digital Design for System-on-Chip • Control Systems Design • Embedded Systems Design • Medical Electronics and E-Health	**Electronic and Electrical Engineering:** **Compulsory modules:** Electronics Industry Dissertation and 2 modules from: • Power Electronics and Drives • Electronic Power Generation by Renewable Sources • Control Systems Design **Optional modules:** • Next Generation Silicon Technologies • Wireless Communications System Design • Data Communications and Sensor Networks • Micro- and Nano-Electromechanical Systems • Digital Design for System-on-Chip • Molecular-Scale Engineering • Quantum Electronics and Spintronics • Antennas and Radio Wave Propagation • Terahertz Technology • Embedded Systems Design	**Electronic and Communications Engineering:** **Compulsory modules:** • Electronics Industry Dissertation **Optional modules:** • Molecular-Scale Engineering • Quantum Electronics and Spintronics • Antennas and Radio Wave Propagation • Terahertz Technology • Embedded Systems Design

The module table provides a flavour of what 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.

Electronics and Nanotechnology **(MEng, BEng)** UCAS CODE HF63

The world has been transformed by the power of silicon microelectronic technology. Communications, transport, science, medicine and entertainment are just some of the fields that have benefited.

The milestone of one billion transistors on a chip was recently reached and such chips are already in use in consumer products such as digital cameras, phones and MP3 players.

And yet, nanotechnologies such as carbon nanotubes, molecular self-assembly and bio-molecular electronics, and new paradigms such as quantum computing and spintronics are set to fuel another great revolution in electronics technology.

This unique and exciting course is focused directly on this interface between the fields of electronics and nanotechnology. It covers the foundations of electronic engineering, from communications systems through to computer engineering, integrated circuit design and micro/nano fabrication.
It enables you to understand the principles of electronics and nanotechnology, in particular the principles of the fabrication and design of modern microelectronic products. The course is one of the first of its kind in the UK to be fully accredited by the IET (Institution of Engineering and Technology).

Careers

Career-wise, the broad coverage of electronics keeps a wide range of options open, whilst the unique nanotechnology exposure means that you will be able to seek top-flight jobs in micro- and nano-electronic design, semiconductor fabrication and in academic research. The excellent reputation of Leeds ensures that Leeds graduates are very highly regarded by employers.

> “I am from India and nanotechnology was always in the news. It’s a great field - engineering is up and coming and nanotechnology has the potential to impact on all aspects of engineering. The reputation of Leeds was a major factor in my decision to come. The labs are fantastic with emphasis on practical work. Some of the skills I have gained are self-learning and independent living; key factors which have given me a great deal of confidence and self-esteem. I have learnt a lot about time management – how to handle my course and my self-study, as well as a part-time job.”
>
> **Siddhant Chowdhury, India,**
> MEng Electronics and Nanotechnology and Electrical Engineering

Course Structure

Electronics and Nanotechnology

Year 1

- Circuit Analysis and Design
- Analytical Techniques
- Electronic Materials and Devices
- Fundamentals of Electrical Engineering
- Communications Systems
- Digital Electronics and Microcontrollers

Year 2

- Embedded Systems Project
- Mobile Applications Project
- High Frequency Circuits and Systems
- Communications Theory
- Transistors and Optoelectronic Devices
- Microelectronics and Nanofabrication
- Molecular Electronics

Year 3

- Professional Studies
- Semiconductor Technology
- RF and Microwave Engineering
- Digital Media Engineering
- Embedded Systems
- Group Project (MEng students)
- Individual Project (BEng students)

Year 4 (MEng)

Compulsory modules:

- Electronics Industry Dissertation
- Individual Project

Optional modules:

- Micro and Nano-Electromechanical Systems
- Terahertz Technology
- Next Generation Silicon Technologies
- Quantum Electronics and Spintronics
- Photonics and Communications Technologies
- Medical Electronics and E-Health
- Molecular Scale Engineering

The module table provides a flavour of what 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.

Mechatronics and Robotics **(MEng, BEng)** UCAS CODE HH36

Mechatronics is about the integration of electronics with mechanical design to create intelligent systems. Mechatronics and robotic systems are at the forefront of technological developments.

Transport, healthcare, entertainment and service are just a few industries that are benefiting from developments in mechatronics and robotics.

These industries now look for graduates that have a broader engineering background including electronic, mechanical and IT skills. This need, coupled with the appeal of intelligent systems, makes mechatronics and robotics a popular choice for students. It is a field with exciting career opportunities and a huge range of applications, from robotics in manufacturing and automation to the automotive, aerospace, medical and leisure and entertainment industries.

The University of Leeds was one of the first universities to offer a degree in the field of mechatronics, and has now been running over 10 years, with regular overhauls to ensure it remains up to date. Our unique multidisciplinary course in Mechatronics and Robotics, a collaboration between the Schools of Electronic and Electrical Engineering and Mechanical Engineering, combines electronics, robotics, computer control and artificial intelligence with mechanical and electronic engineering.

The course is developing a new breed of engineers that have skills and knowledge across these boundaries. By remaining at the forefront of developments in this area we offer you a syllabus that is dynamic and up to date. The course is accredited by both the Institution of Engineering and Technology (IET) and the Institute of Mechanical Engineers (IMechE).

Student Projects

- Robotics for volcanic exploration
- Robotic hands
- Golf swing trainers
- Design of a climbing robot
- Design of underwater propulsion systems
- Mechatronic modelling of the spinal column
- Design of a heat sensing robot
- Simulation and design of VTOL aircraft simulator
- Robotic arthrosis for assisting walking for disabled people.

> “The best aspect of studying at the University is the friendly atmosphere you instantly become a part of. The ability to seek help from almost anybody played a vital part in the confidence of my studies.”
>
> **Philip, UK,**
> MEng Mechatronics and Robotics

Course Structure

Mechatronics and Robotics

Year 1

- Circuit Analysis and Design
- Fundamentals of Electrical Engineering
- Design and Manufacture 1
- Digital Electronics and Microcontrollers
- Solid Mechanics
- Engineering Mathematics

Year 2

- Energy Systems and Control Engineering
- Mechatronics and Robotics Systems
- Embedded Systems Project
- Design and Manufacture 2
- Computers in Engineering Analysis
- Vibration and Control

Year 3

Compulsory modules:
- Robotics and Machine Intelligence
- Electric Drive Systems
- Professional Skills
- Embedded Systems
- Level 3 Major Project

Optional modules:
- Biomedical Engineering
- Digital Media Engineering
- Vehicle Design and Analysis

Year 4 (MEng)

Compulsory modules:
- Team Design Project
- Mechatronics and Robotics Applications

Optional modules:
- Control Systems Design
- Power Electronics and Drive
- Automotive Driveline Engineering
- Digital Design for System-on-Chip
- Combustion in Engines

The module table provides a flavour of what 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.

Music, Multimedia and Electronics **(BSc)** UCAS CODE WGH4

Rapid advances in computing power and software development have led to numerous innovations in entertainment and the performing arts.

In collaboration with the School of Music, our Music, Multimedia and Electronics degree provides cutting-edge interdisciplinary study in these exciting and emerging technologies, crossing the boundary of arts and science. Building on core modules in electronics and music technology, the course offers specialisation in digital media, audio and image processing and multimedia techniques and applications.

A distinctive feature of the course is that it covers both software and hardware aspects of electronics and their application to music and multimedia technology. The degree is designed to equip you with skills and knowledge for a range of careers including music/multimedia software and systems, digital/interactive broadcast technologies, audio/video electronics, and music production. The course draws on internationally acclaimed research from the University of Leeds' Interdisciplinary Centre for Scientific Research in Music and top rated research in electronic systems and communications. You will benefit from the extensive electronics and computing laboratories, as well as a dedicated acoustics laboratory within the School of Electronic and Electrical Engineering.

The School of Music offers access to a suite of state-of-the-art recording studios, practice rooms and a multimedia teaching laboratory.

Student Projects

- Using microprocessor technology to create interfaces between musical performance and physical performer motion
- Active loudspeaker design and characterisation
- The design of 'MIDI drum brushes' which activates synthesiser voices to augment the acoustic drum sounds
- Wavefield synthesis with iPad control surface.

Careers

The degree is designed to equip students with skills and knowledge for a range of careers including: digital media, audio and consumer electronics, broadcasting, studio engineering and music editing and production.

> "I chose the course because it suits who I am and what I'm about. I have played the piano most of my life and I work quite closely with audio engineering on a weekly basis. I have a great passion for music and this course was everything I needed."
>
> **Christopher,**
> BSc Music, Multimedia and Electronics

Course Structure

Music, Multimedia and Electronics

Year 1	
• Electronic Music Creation and Production 1 • Introduction to the Sciences of Music • Digital Electronics and Microcontrollers • Circuit Analysis and Design • Analytical Techniques	**Optional modules:** • Understanding Music • Composition

Year 2	
Compulsory modules: • Electronic Music Creation and Production 2 • Music Technology Skills and Techniques • Embedded Systems Project • Mobile Applications Project	**Optional modules:** • Music in Practice • Composition

Year 3	
Compulsory modules: • Digital Media Engineering • Embedded Systems • Music, Multimedia and Electronics Project	**Optional modules:** • Major Music Technology • Major Composition

The module table provides a flavour of what 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 **electronics@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://internationalfoundationyear.leeds.ac.uk

Foundation Course (CFGO)
Students who do not have the required qualifications 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 electronic and electrical 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
Electronics and Nanotechnology (MEng, BEng)	HF63	AAA including Mathematics
Electronic Engineering (MEng, BEng)	H610	
Electronic and Electrical Engineering (MEng, BEng)	H600	
Electronic and Communications Engineering (MEng, BEng)	H640	
Mechatronics and Robotics (MEng, BEng)	HH36	
Music, Mutlimedia and Electronics (BSc)	WGH4	AAB including Music or Music Technology at grade B or higher or similar evidence of musical literacy eg ABSRM grade 5 or equivalent. Plus AS level Mathematics grade B or higher.

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 Admissions Tutor, suitable applicants who are able to reach the School with reasonable ease will be invited for an interview. This gives you a chance to look around the School and the University and meet some of our undergraduates. The interview also gives you the opportunity to discuss your application with a member of staff. We appreciate that not all applicants are able to attend an interview and in such cases offers will be based on the information on the UCAS form.

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 the top ten UK research intensive universities. We have performed consistently well in the National Student Survey, in fact, in the latest survey, 86% of students said they were very satisfied or 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-of-the-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.

Located at the heart of the UK, Leeds is midway between Edinburgh and London making it an ideal centre from which to visit other parts of the country. Leeds can be reached easily by train from any part of the UK, and is served by Leeds/Bradford International Airport, with train connections from Manchester and London International Airports.

More Information
If you require further detailed information, are uncertain about your qualifications or if you have special needs, please contact the Admissions Team prior to making a formal application.

Undergraduate Admissions Team
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