For general undergraduate enquiries contact:
The Enquiry Centre
t: +44 (0)115 951 5559
e: undergraduate-enquiries@nottingham.ac.uk
w: www.nottingham.ac.uk/faqs

Electrical and Electronic Engineering
Undergraduate study 2016
www.nottingham.ac.uk/eee
Welcome to the Department of Electrical and Electronic Engineering

Electrical and electronic engineering continues to transform the way we live, from the latest consumer products through to sophisticated scientific, industrial and healthcare technologies. The subject area encompasses an exciting range of topics and develops a variety of skills that are in great demand by employers.

We offer a balanced portfolio of degrees, introducing advanced subjects within the context of practical engineering. This provides both an appreciation of the whole field and allows you to make informed and flexible choices on your degree specialisation and project work. We take pride in providing every student with high-quality teaching in state-of-the-art facilities and a supportive and friendly environment. Students can also choose to study abroad and take industrial placements to complement their studies in Nottingham.

I hope that this brochure provides the answers to any questions you have about the exciting opportunities that studying electrical and electronic engineering at Nottingham can provide for you. However, if you have any further questions, or if you would like to visit us on one of our University or department open days, please do not hesitate to contact our friendly admissions team using one of the methods listed at the end of this brochure.

Professor Barrie Hayes-Gill
Head of Department of Electrical and Electronic Engineering

Don’t forget to watch our videos from staff and students from across the Faculty of Engineering: www.nottingham.ac.uk/go/watch-engfaculty
Why study electrical and electronic engineering at Nottingham?

Study with us because:

• our links with industry provide a variety of summer and year-out placement opportunities for our students
• our flexible course structure will allow you to experience many aspects of electrical and electronic engineering before you choose your final degree specialisation
• our globally recognised research gives you the opportunity to undertake projects that are both exciting and cutting-edge

Industrial links
The department is recognised in industry and among other universities as one of the best. We maintain strong links with over 30 top companies; some companies support student projects and laboratories, others sponsor students and most offer summer or year-out, industry-based placements (our course structure has the flexibility to allow you to do this during your studies for all of our degree courses, and we have now also introduced an Electrical and Electronic Engineering with Industrial Year course). The E3 academy offers sponsorship from UK-based companies to students interested in electrical energy engineering, and is endorsed by the Institution of Engineering and Technology (IET).

Teaching and learning
At Nottingham we will help you manage the learning transition between school/college and university. The core curriculum delivered in years one and two is taught by a team of highly qualified engineers who have vast experience in teaching science and engineering. This is backed up by the tutorial system – you are allocated a personal tutor when you arrive in Nottingham, and you meet with them regularly (usually weekly), to review academic progress. They are also available to help with any personal matters. Additionally, we make sure you spend plenty of time in the laboratory developing the design and fault-finding skills required of true engineers.

As you move to years three and four, you will choose specialist modules from a wide selection of different topics. Some of the lectures given in these modules will be presented by our industrial contacts who will describe the real-world applications of the techniques we teach. In these later years, you undertake more extensive project work and this is where you truly develop your skills as an independent engineer.

Third-year student Sana Arif working on her solo project, a hydrogen fuel cell rig.
Student support
By keeping student:staff ratios small in tutorial and laboratory classes in the first two years, we can work closely with students and give immediate feedback and advice. This also means that we get to know students on an individual basis and can identify problems and offer support at an early stage.

Research reputation
Academic staff in the department have international reputations for the excellence of their research. According to the 2014 UK Research Excellence Framework (REF), more than 98% of research in the Faculty of Engineering is of international quality with 85% graded as ‘world-leading’ or ‘internationally excellent’. This research background helps us to ensure that we offer up to date degree courses that provide an insight into cutting-edge electrical and electronic engineering.

Quality, accreditation and recognition
All our degree courses are accredited by the Institution of Engineering and Technology (IET), under licence from the UK regulator, the Engineering Council. Accreditation is a mark of assurance that the degree meets the standards set by the Engineering Council in the UK Standard for Professional Engineering Competence (UK-SPEC). An accredited degree will provide you with some or all of the underpinning knowledge, understanding and skills for eventual registration as an Incorporated (IEng) or Chartered Engineer (CEng). Some employers recruit preferentially from accredited degrees, and an accredited degree is likely to be recognised by other countries that are signatories to international accords.

The department offers all its undergraduate students free membership of the IET, enabling them to benefit from the additional resources of this internationally recognised professional body – including technology updates, local events and careers support.

“We don’t just teach you about electrical and electronic engineering, we provide a foundation for your future career. Our courses manage the transition from your school/college to university and your career beyond, developing the skills and knowledge you need to make an impact on the digital age."

Dr Marion Unwin
Director of Teaching and Learning
## Degree courses

Electrical and electronic engineering student Jonathan Lui in the anechoic chamber.

<table>
<thead>
<tr>
<th>Degree title</th>
<th>UCAS code</th>
<th>Duration</th>
<th>A levels</th>
<th>IB</th>
<th>Places</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single honours</strong></td>
<td></td>
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<tr>
<td>BEng Electrical and Electronic Engineering</td>
<td>H603</td>
<td>3 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
<td>*</td>
</tr>
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<td>H600</td>
<td>4 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
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<td>BEng Electrical and Electronic Engineering with a Year Abroad</td>
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<td>AAA-ABB</td>
<td>36-32</td>
<td>*</td>
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<td>4 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
<td>*</td>
</tr>
<tr>
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<td>AAA-ABB</td>
<td>36-32</td>
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<tr>
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<td>MEng Electrical Engineering</td>
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<td>36-32</td>
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<td>BEng Electrical Engineering and Renewable Energy Systems</td>
<td>HH6F</td>
<td>3 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
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<tr>
<td>MEng Electrical Engineering and Renewable Energy Systems</td>
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<td>MEng Electronic and Communications Engineering</td>
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<td>BEng Electronic and Computer Engineering</td>
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<td>AAA-ABB</td>
<td>36-32</td>
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</tr>
<tr>
<td>MEng Electronic and Computer Engineering</td>
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<td>AAA-ABB</td>
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<td><strong>Major/minor honours</strong></td>
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<tr>
<td>BEng Electrical and Electronic Engineering with Management</td>
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<td>3 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
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<tr>
<td>MEng Electrical and Electronic Engineering with Management</td>
<td>H6NG</td>
<td>4 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
<td>*</td>
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<tr>
<td>BEng Electrical and Electronic Engineering with Mathematics</td>
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<td>3 years</td>
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<tr>
<td>MEng Electrical and Electronic Engineering with Mathematics</td>
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<td>4 years</td>
<td>AAA-ABB</td>
<td>36-32</td>
<td>*</td>
</tr>
</tbody>
</table>

* 120 places for all courses in the Department of Electrical and Electronic Engineering.
Keeping your options open is what our degrees are all about. Our first and second years are structured to enable you to transfer between most of our electrical and electronic degree courses. This gives you the opportunity to discover both electrical and electronic engineering before committing to your final degree programme. The final year of our courses allows flexibility in your module options and project choices, so you can follow your interests. A small selection of third and fourth year specialist modules is given on the course pages in this brochure. In the final year, each student completes a substantial individual project in an area of their choice.

Students may select to take an industrial placement at the end of their second or third year. Placements are typically with large organisations and allow students to practise and further develop their engineering skills. Industrial placements are competitive, but are fully paid and enhance your career prospects.

### Year one
- Common first year for all courses
- Develop fundamental scientific and maths knowledge and skills
- Study of electrical and electronic components and building blocks
- Experiments and project based work

### Year two
- Continue development of advanced skills and knowledge
- Study of systems
- Project work and detailed design projects

### Year in industry (optional)

### Final year (BEng)/Final years (MEng)
- Choose options to specialise in one particular aspect, or maintain a broad knowledge base
- Major solo project (between 30% and 40% of year)
Department of Electrical and Electronic Engineering
www.nottingham.ac.uk/eee

Single honours degrees

BEng/MEng Electrical and Electronic Engineering

Electrical and electronic engineering offers students the opportunity to select from a variety of topics, including electronic design, communications, software engineering, computer modelling, microelectronics, power generation and distribution, electrical machines, signal processing, renewable energy systems and instrumentation. Multidisciplinary is definitely the word!

Potential career paths

With the broad range of skills you will acquire when studying this degree, your future career prospects are excellent in areas as diverse as software development, fibre optic and mobile communications, aerospace technology, automotive systems or renewable energy technologies. For example, the ever-increasing range of technologies emerging into the automotive market makes this one of the most exciting and dynamic manufacturing sectors in the world. Currently, around 90% of innovation in new cars is electronics-based, with industry analysts forecasting that electronic content will account for 40% of the cost of a mid-sized car. The automotive industry is also predicting the introduction of new products in the areas of advanced lighting and night vision, as well as technologies to help vehicle manufacturers comply with increasingly stringent fuel economy, environmental, and safety standards.

The healthcare and biosciences sectors have also seen the deployment of new sensors and imaging technologies that employ the latest electronic circuitry utilising systems on silicon with on and off chip RF telecommunication links. Such technology pervades and benefits the whole of society and offers exciting career opportunities.

Year abroad

While all courses in the department can be taken with a year abroad (normally during the second or third year), anyone with a keen interest in studying abroad is encouraged to enrol on our Electrical and Electronic Engineering with a Year Abroad programme. Providing your exam marks are high, you will be guaranteed a place at either our Malaysia or China Campus. There will also be opportunities for you to apply for places at several other leading universities in countries including America, Australia or Canada.

Year in industry

Industrial placements are a great opportunity for students to practise and further develop their engineering skills, and give a significant boost to their employment prospects. Placements are usually undertaken in companies from major global organisations to smaller consultancies and technology specialists. Students registered on the BEng programme will undertake their year-long placement between years two and three of the taught course while MEng students do their placements between years three and four.

Placements are competitive and students need to apply, and may have to go through an assessment centre and a further interview process. The Faculty Industrial Placement Team uses our excellent industry links to support our year in industry courses. During the placement, students are classed as employees of the host company and are paid, but also remain fully registered with the University during this time and receive support from their university tutor during the placement.

Inter-campus exchanges available

China and Malaysia

BEng/MEng Electrical and Electronic Engineering (H603/H600)

<table>
<thead>
<tr>
<th>Year one</th>
<th>Year two</th>
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<tbody>
<tr>
<td>Core modules:</td>
<td>Core modules:</td>
</tr>
<tr>
<td>• Introduction to Circuits and Fields</td>
<td>• Signal Processing and Control Engineering</td>
</tr>
<tr>
<td>• Introduction to Electronic Engineering</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>• Introduction to Communications Engineering</td>
<td>• Power Supply Electronics</td>
</tr>
<tr>
<td>• Introduction to Computer Engineering</td>
<td>• Electronic Engineering</td>
</tr>
<tr>
<td>• Introduction to Electrical Engineering</td>
<td>• Software Engineering Design</td>
</tr>
<tr>
<td>• Introduction to Real-Time Systems</td>
<td>• Professional Skills for Electrical and Electronic</td>
</tr>
<tr>
<td>• Laboratory and Presentation Skills A</td>
<td>Engineers</td>
</tr>
<tr>
<td>• Engineering Mathematics 1</td>
<td>• Electrical Engineering Design Project</td>
</tr>
<tr>
<td>• Engineering Mathematics 2</td>
<td>• Electronic Construction Project</td>
</tr>
<tr>
<td>Optional modules include:</td>
<td>Optional modules include:</td>
</tr>
<tr>
<td>• Electronic Design</td>
<td>• Electronic Design</td>
</tr>
<tr>
<td>• Solid State Devices</td>
<td>• Solid State Devices</td>
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<tr>
<td>• VLSI Design</td>
<td>• VLSI design</td>
</tr>
<tr>
<td>• Telecommunication Electronics</td>
<td>• Telecommunication Electronics</td>
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<tr>
<td>• Power Networks</td>
<td>• Power Networks</td>
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<tr>
<td>• Electrical Machines</td>
<td>• Electrical Machines</td>
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<tr>
<td>• Energy Conversion for Motor and Generator Drives</td>
<td>• Energy Conversion for Motor and Generator Drives</td>
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<tr>
<td>• Power Electronic Design</td>
<td>• Power Electronic Design</td>
</tr>
<tr>
<td>• Control Systems Design</td>
<td>• Digital Communications</td>
</tr>
<tr>
<td>• Fields, Waves and Antennas</td>
<td>• Web-Based Computing</td>
</tr>
<tr>
<td>• Digital Communications</td>
<td>• Digital Video Communication Systems</td>
</tr>
<tr>
<td>• Web-Based Computing</td>
<td>• Embedded Computing</td>
</tr>
<tr>
<td>• Communication Systems</td>
<td>• Microwave Communications</td>
</tr>
<tr>
<td>• Microwave Communications</td>
<td>• IT Infrastructure</td>
</tr>
<tr>
<td>• IT Infrastructure Engineering</td>
<td>• Engineering Software: Design and Implementation</td>
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</table>

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<tr>
<th>Year three MEng</th>
<th>Year three</th>
<th>Year four</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core modules:</td>
<td>Core modules:</td>
<td>Core modules:</td>
</tr>
<tr>
<td>• Third-Year Project</td>
<td>• Control Systems Design</td>
<td>• Industrial Research Orientated Project</td>
</tr>
<tr>
<td>• Business Planning for Engineers</td>
<td>• Industrial Awareness</td>
<td>Optional modules include:</td>
</tr>
<tr>
<td></td>
<td>• Fields, Waves and Antennas</td>
<td>• RF Microelectronics</td>
</tr>
<tr>
<td>Optional modules include:</td>
<td>• Group Project</td>
<td>• Photonic Communications Components</td>
</tr>
<tr>
<td>• Electronic Design</td>
<td></td>
<td>• HDL for Programmable Logic</td>
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<tr>
<td>• Solid State Devices</td>
<td></td>
<td>• Bioelectronic and Biophotonic Interfacing</td>
</tr>
<tr>
<td>• VLSI Design</td>
<td>• VLSI design</td>
<td>• Advanced AC Drives</td>
</tr>
<tr>
<td>• Telecommunication Electronics</td>
<td>• Telecommunication Electronics</td>
<td>• Power Electronics Integration</td>
</tr>
<tr>
<td>• Power Networks</td>
<td>• Power Networks</td>
<td>• Advanced Power Conversion</td>
</tr>
<tr>
<td>• Electrical Machines</td>
<td>• Electrical Machines</td>
<td>• Power Systems for Aerospace, Marine and Automotive Applications</td>
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<tr>
<td>• Energy Conversion for Motor and Generator Drives</td>
<td>• Energy Conversion for Motor and Generator Drives</td>
<td>• Advanced Electrical Machines</td>
</tr>
<tr>
<td>• Power Electronic Design</td>
<td>• Power Electronic Design</td>
<td>• Instrumentation and Measurement</td>
</tr>
<tr>
<td>• Control Systems Design</td>
<td>• Digital Communications</td>
<td>• Digital Signal Processing</td>
</tr>
<tr>
<td>• Fields, Waves and Antennas</td>
<td>• Web-Based Computing</td>
<td>for Telecommunications, Multimedia and Instrumentation</td>
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<tr>
<td>• Digital Communications</td>
<td>• Digital Video Communication Systems</td>
<td>• Advanced Control System Design</td>
</tr>
<tr>
<td>• Web-Based Computing</td>
<td>• Embedded Computing</td>
<td>• Mobile Communications</td>
</tr>
<tr>
<td>• Communication Systems</td>
<td>• Microwave Communications</td>
<td>• Optical Communications and Networks</td>
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<tr>
<td>• Microwave Communications</td>
<td>• IT Infrastructure</td>
<td>• Introduction to Finance</td>
</tr>
<tr>
<td>• IT Infrastructure Engineering</td>
<td>• Engineering Software: Design and Implementation</td>
<td>• Entrepreneurship and Business</td>
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<td></td>
<td>• Mathematics for Engineering Management</td>
<td>• Science, Technology and Business</td>
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<tr>
<td></td>
<td>• Advanced Mathematical Techniques in Ordinary Differential Equations for Engineers</td>
<td>• Introduction to Marketing</td>
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<td></td>
<td>• Partial Differential Equations for Engineers</td>
<td>• New Venture Creation</td>
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</table>

Inter-campus exchanges available

China and Malaysia
BEng/MEng Electrical Engineering

Electrical engineering concerns the generation, supply, distribution, application and control of electrical energy. It is also the powerhouse of the manufacturing industry – think of all the electrically powered equipment on a modern production line – without it, industry and the nation would grind to a halt!

With the drive to a sustainable future with lower carbon emissions, the intelligent use of electricity is the key to the more efficient use of energy. Wind, wave and other renewable sources, hybrid and all electric cars, more electric ships and aircraft are all developing industries that are crying out for qualified electrical engineers.

**Potential career paths**

This degree is designed for students wishing to develop knowledge and skills for a career in these areas. Students study electrical subjects covering power generation and distribution, electrical machines, power electronics, power quality, electromagnetic compatibility (EMC) and industrial drive processes, as well as relevant subjects covering control, programming and signal processing. Research activities in these areas are internationally recognised and have attracted considerable industrial collaboration – you will be taught by people who are at the cutting edge of these technologies.

Students following this degree can move into challenging and exciting careers in power distribution, future transport technologies (aerospace, rail, automotive) and industrial process control and automation.

**Inter-campus exchanges available**

China and Malaysia

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### BEng/MEng Electrical Engineering (H622/H601)

<table>
<thead>
<tr>
<th>BEng</th>
<th>MEng</th>
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<tbody>
<tr>
<td><strong>Year one</strong></td>
<td><strong>Year two</strong></td>
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<tr>
<td><strong>Core modules:</strong></td>
<td><strong>Core modules:</strong></td>
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<tr>
<td>• Introduction to Circuits and Fields</td>
<td>• Signal Processing and Control Engineering</td>
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<tr>
<td>• Introduction to Electronic Engineering</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>• Introduction to Communications Engineering</td>
<td>• Power Supply Electronics</td>
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<tr>
<td>• Introduction to Computer Engineering</td>
<td>• Electronic Engineering</td>
</tr>
<tr>
<td>• Introduction to Electrical Engineering</td>
<td>• Software Engineering Design</td>
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<tr>
<td>• Introduction to Real-Time Systems</td>
<td>• Professional Skills for Electrical &amp; Electronic</td>
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<tr>
<td>• Laboratory and Presentation Skills A</td>
<td>Engineers</td>
</tr>
<tr>
<td>• Engineering Mathematics 1</td>
<td>• Electrical Engineering Design Project</td>
</tr>
<tr>
<td>• Engineering Mathematics 2</td>
<td>• Electronic Construction Project</td>
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<tr>
<td><strong>Optional modules include:</strong></td>
<td>• Probabilistic and Numerical Techniques for</td>
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<tr>
<td>• Power Networks</td>
<td>Engineers</td>
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<tr>
<td>• Electrical Machines</td>
<td>• Mathematical Techniques for Electrical and</td>
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<td>• Energy Conversion for Motor</td>
<td>Electronic Engineers 1</td>
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<tr>
<td>and Generator Drives</td>
<td><strong>Year four</strong></td>
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<tr>
<td>• Power Electronic Design</td>
<td><strong>Core modules:</strong></td>
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<tr>
<td>• Control Systems Design</td>
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<tr>
<td>• Fields, Waves and Antennas</td>
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<td>• Electronic Design</td>
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<td>• Solid State Devices</td>
<td>• Advanced AC Drives</td>
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<tr>
<td>• VLSI Design</td>
<td>• Power Electronics Integration</td>
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<tr>
<td>• Telecommunication Electronics</td>
<td>• Advanced Power Conversion</td>
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<tr>
<td>• Digital Communications</td>
<td>• Power Systems for Aerospace,</td>
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<td>• Web-Based Computing</td>
<td>Marine and Automotive</td>
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<tr>
<td>• Digital Video Communication</td>
<td>Applications</td>
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<td>Systems</td>
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<td>• Embedded Computing</td>
<td>• Instrumentation and</td>
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<td>• Microwave Communications</td>
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<td>• IT Infrastructure</td>
<td>• RF Microelectronics</td>
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<td>• HDL for Programmable Logic</td>
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<td></td>
<td>• Digital Signal Processing for</td>
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<td>Telecommunications,</td>
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<td>Multimedia and Instrumentation</td>
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<td></td>
<td>• Advanced Control System</td>
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<td>• Mobile Communications</td>
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<td>• Hardware Accelerated</td>
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<td>Computing</td>
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<td>• Introduction to Finance</td>
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<td>• Entrepreneurship and Business</td>
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<td>• Science, Technology and</td>
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<td></td>
<td>Business</td>
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<td></td>
<td>• Introduction to Marketing</td>
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<td></td>
<td>• New Venture Creation</td>
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**Core modules:**

- Third-Year Project
- Business Planning for Engineers
- Electronics 1
- Mathematical Techniques for Electrical and Electronic Engineers
- Probabilistic and Numerical Techniques for Electronic Construction Project
- Electrical Engineering Design Project
- Software Engineering Design
- Electronic Engineering
- Power Supply Electronics
- Telecommunications
- Signal Processing and Control Engineering
- Power Networks
- Mechanical Services
- Control Systems Design
- Energy Conversion for Motor and Generator Drives
- Power Electronic Design
- Control Systems Design
- Fields, Waves and Antennas
- Electronic Design
- Solid State Devices
- VLSI Design
- Telecommunication Electronics
- Digital Communications
- Web-Based Computing
- Digital Video Communication Systems
- Embedded Computing
- Microwave Communications
- IT Infrastructure

**Optional modules include:**

- Electronic Design
- Solid State Devices
- VLSI Design
- Telecommunication Electronics
- Digital Video Communication Systems
- Embedded Computing
- IT Infrastructure
- Engineering Software: Design and
  Implementation
- Advanced Mathematical Techniques in Ordinary
  Differential Equations for Engineers
- Computerised Mathematical Methods in Engineering

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**Year three**

**Core modules:**

- Third-Year Project
- Business Planning for Engineers
- Electronics 1
- Mathematical Techniques for Electrical and Electronic Engineers
- Probabilistic and Numerical Techniques for Electronic Construction Project
- Electrical Engineering Design Project
- Software Engineering Design
- Electronic Engineering
- Power Supply Electronics
- Telecommunications
- Signal Processing and Control Engineering
- Power Networks
- Mechanical Services
- Control Systems Design
- Energy Conversion for Motor and Generator Drives
- Power Electronic Design
- Control Systems Design
- Fields, Waves and Antennas
- Electronic Design
- Solid State Devices
- VLSI Design
- Telecommunication Electronics
- Digital Communications
- Web-Based Computing
- Digital Video Communication Systems
- Embedded Computing
- Microwave Communications
- IT Infrastructure

**Optional modules include:**

- Electronic Design
- Solid State Devices
- VLSI Design
- Telecommunication Electronics
- Digital Video Communication Systems
- Embedded Computing
- IT Infrastructure
- Engineering Software: Design and
  Implementation
- Advanced Mathematical Techniques in Ordinary
  Differential Equations for Engineers
- Computerised Mathematical Methods in Engineering

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**Year four**

**Core modules:**

- Third-Year Project
- Business Planning for Engineers
- Electronics 1
- Mathematical Techniques for Electrical and Electronic Engineers
- Probabilistic and Numerical Techniques for Electronic Construction Project
- Electrical Engineering Design Project
- Software Engineering Design
- Electronic Engineering
- Power Supply Electronics
- Telecommunications
- Signal Processing and Control Engineering
- Power Networks
- Mechanical Services
- Control Systems Design
- Energy Conversion for Motor and Generator Drives
- Power Electronic Design
- Control Systems Design
- Fields, Waves and Antennas
- Electronic Design
- Solid State Devices
- VLSI Design
- Telecommunication Electronics
- Digital Video Communication Systems
- Embedded Computing
- IT Infrastructure
- Engineering Software: Design and
  Implementation
- Advanced Mathematical Techniques in Ordinary
  Differential Equations for Engineers
- Computerised Mathematical Methods in Engineering

**Optional modules include:**

- Electronic Design
- Solid State Devices
- VLSI Design
- Telecommunication Electronics
- Digital Video Communication Systems
- Embedded Computing
- IT Infrastructure
- Engineering Software: Design and
  Implementation
- Advanced Mathematical Techniques in Ordinary
  Differential Equations for Engineers
- Computerised Mathematical Methods in Engineering

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**Inter-campus exchanges available**

China and Malaysia

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**New Venture Creation**
BEng/MEng Electrical Engineering and Renewable Energy Systems

The recent increase in the use of wind, solar and other renewable energy sources has highlighted the challenges facing future electrical engineers – interfacing renewable sources to the electricity distribution system, maintaining stability in the presence of many small energy sources, and guaranteeing an electrical supply in the presence of intermittent sources such as solar power.

Concentrating on electrical technology, this degree course provides the knowledge and skills required for future power engineers. Students will study electrical subjects covering power generation and distribution, electrical machines, power electronics and power conversion, and power quality as well as a dedicated stream of modules looking at renewable sources, alternative fuel systems and future energy infrastructures. A major final-year project focuses on developing new technologies for renewable energy systems.

Potential career paths
High energy consumption and dwindling fossil energy supplies, as well as the far-reaching impacts of global warming, mean that there is a need for renewable energy supplies (for example wind or solar energy) to be more widely harnessed in order to achieve a reduction in greenhouse gas emissions. The Electrical Engineering and Renewable Energy Systems degree course includes a number of modules which introduce the technology related to renewable energy supplies.

Electrical engineering technology is central to the design of wind and tidal generators or solar panels. However, it is equally important that this energy is captured and transferred into the main power distribution grid as efficiently as possible. This transfer of energy is achieved with a technology known as power electronics, which uses semiconductors rated at thousands of volts and amps, and requires accurate microprocessor control. Therefore, there is a demand for skilled individuals who understand not only the principles behind the capture of energy supplies, but also the technologies used in converting this energy and the systems and networks associated with power grid control.

Inter-campus exchanges available
China and Malaysia

BEng/MEng Electrical Engineering and Renewable Systems (HH6F/HH62)

<table>
<thead>
<tr>
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<th>Year two</th>
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<td>• Introduction to Circuits and Fields</td>
<td>• Signal Processing and Control Engineering</td>
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<tr>
<td>• Introduction to Electronic Engineering</td>
<td>• Telecommunications</td>
</tr>
<tr>
<td>• Introduction to Communications Engineering</td>
<td>• Power Supply Electronics</td>
</tr>
<tr>
<td>• Introduction to Computer Engineering</td>
<td>• Electronic Engineering</td>
</tr>
<tr>
<td>• Introduction to Electrical Engineering</td>
<td>• Professional Skills for Electrical and Electronic Engineers</td>
</tr>
<tr>
<td>• Laboratory and Presentation Skills A</td>
<td>• Electrical Engineering Design Project – Renewables</td>
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<tr>
<td>• Introduction to Renewable and Sustainable Energy Sources</td>
<td>• Electronic Construction Project</td>
</tr>
<tr>
<td>• Engineering Mathematics 1</td>
<td>• Energy and the Environment</td>
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<tr>
<td>• Engineering Mathematics 2</td>
<td>• Probabilistic and Numerical Techniques for Engineers</td>
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<th>Year three</th>
<th>Year three</th>
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<td><strong>MEng</strong></td>
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<td><strong>Core modules:</strong></td>
<td><strong>Core modules:</strong></td>
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<td>• Power Networks</td>
<td><strong>Optional modules include:</strong></td>
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<td>• Electrical Machines</td>
<td>• Technologies for the Hydrogen Transport Economy</td>
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<td><strong>Optional modules include:</strong></td>
<td>• Control Systems Design</td>
<td>• Advanced AC Drives</td>
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<tr>
<td>• Renewable Generation Technologies and Control</td>
<td>• Energy Conversion for Motor and Generator Drives</td>
<td>• Technologies for Wind Generation</td>
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<td>• FACTS and Distributed Generation</td>
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<td>• Advanced Electrical Machines</td>
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<td>• Power Networks</td>
<td>• Industrial Awareness</td>
<td>• Introduction to Finance</td>
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<td>• Electrical Machines</td>
<td>• Group Project</td>
<td>• Entrepreneurship and Business</td>
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<tr>
<td>• Energy Conversion for Motor and Generator Drives</td>
<td>• Renewable Generation Technologies and Control</td>
<td>• Science, Technology and Business</td>
</tr>
<tr>
<td>• Power Electronic Design</td>
<td>• FACTS and Distributed Generation</td>
<td>• Introduction to Marketing</td>
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<td>• Control Systems Design</td>
<td><strong>Optional modules include:</strong></td>
<td>• New Venture Creation</td>
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<tr>
<td>• Electronic Design</td>
<td>• Mathematics for Engineering Management</td>
<td><strong>Core modules:</strong></td>
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<tr>
<td>• Solid State Devices</td>
<td>• Advanced Mathematical Techniques in Ordinary Differential Equations for Engineers</td>
<td><strong>Optional modules include:</strong></td>
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<tr>
<td>• VLSI Design</td>
<td>• Embedded Computing</td>
<td>• Technologies for the Hydrogen Transport Economy</td>
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<tr>
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<td>• Microwave Communications</td>
<td>• Advanced AC Drives</td>
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<tr>
<td>• Microwave Communications</td>
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<td>• Technologies for Wind Generation</td>
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<td>• Advanced Electrical Machines</td>
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<td>• Introduction to Finance</td>
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<td>• Science, Technology and Business</td>
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<td>• Introduction to Marketing</td>
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<td>• New Venture Creation</td>
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</table>
BEng/MEng Electronic Engineering

The field of electronic engineering continues to dominate the world of automation technology, IT and global communications. There is a huge range of job opportunities available in research, circuit and systems development, applications, commissioning and support, project management, consultancy, marketing, sales and many more, in a wide range of application areas such as entertainment (audiovisual systems), communications systems and instrumentation (medical, industrial).

This degree allows the widest possible choice of modules in the fields of electronic design, instrumentation, communications, optical engineering, new electronic devices, microelectronics, very-large-scale integration (VLSI) and engineering software. Final year project work may be within any of these fields.

The department has very strong research teams working in medical electronics, advanced instrumentation techniques and VLSI design applications. The department is also internationally recognised for its work in healthcare and new ultra-high speed electronic and optical devices. This means you are taught by world leaders in their field.

Other technological areas our graduates move into include audio visual technologies and satellite communications.

Potential career paths

Your phone or tablet contains sensors for touch, light (including the camera), sound, orientation, acceleration and more. The use of integrated sensors will become even more prevalent as the human interface continues to evolve beyond the old-fashioned keyboard and screen. All these sensors require electronic circuits to interface between what happens in the real world (which is analogue) and the digital heart of your device.

Inter-campus exchanges available

China and Malaysia

BEng/MEng Electronic Engineering (H612/H610)

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<td>• Introduction to Circuits and Fields</td>
<td>• Signal Processing and Control Engineering Telecommunications</td>
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<tr>
<td>• Introduction to Electronic Engineering</td>
<td>• Power Supply Electronics</td>
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<tr>
<td>• Introduction to Communications Engineering</td>
<td>• Electronic Engineering</td>
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<tr>
<td>• Introduction to Computer Engineering</td>
<td>• Software Engineering Design</td>
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<td>• Introduction to Electrical Engineering</td>
<td>• Professional Skills for Electrical and Electronic Engineers</td>
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<tr>
<td>• Introduction to Real-Time Systems</td>
<td>• Electrical Engineering Design Project</td>
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<tr>
<td>• Laboratory and Presentation Skills A</td>
<td>• Electronic Construction Project</td>
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<tr>
<td>• Engineering Mathematics 1</td>
<td>• Probabilistic and Numerical Techniques for Engineers</td>
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<td>• Engineering Mathematics 2</td>
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</tbody>
</table>
BEng/MEng Electronic and Communications Engineering

This degree course is designed for those students who are particularly interested in communications and their underlying technologies. Students on this degree study a range of electronic engineering topics including electronic design, software engineering, computer modelling, microelectronics, signal processing and instrumentation, but have specialist modules in telecommunications devices, the principles of telecommunications, digital systems and telecommunications systems. Mobile communications, DVD technology, optical and microwave communications and digital television are studied in detail.

In the final year, each student completes an individual project, which involves detailed investigation and research into a communications topic. The department has strong research activity in optical and microwave communications and many opportunities for industrial project collaboration exist.

Communications continues to be a strong growth area for employment especially in fibre-optic, mobile and broadcast telecommunications, so your future career prospects are excellent.

Potential career paths

The electronic engineering and the electronic and communications engineering degree courses include modules that introduce the technology underpinning telecommunication systems and networks.

The use of optical fibres to facilitate high data rate transmission is fundamental to the success of the internet and is critical to the future development of our information-based society with its seemingly insatiable demand for bandwidth.

Early systems were based on simple point-to-point fibre links between a transmitter (typically a semiconductor laser) and receiver, with all other functionality provided electronically. Optical systems are becoming complex (and sometimes vast) networks where, to provide greater speed and flexibility, the data often remains optical while it is switched, regenerated and otherwise processed. Thus, there is a demand for a diverse set of skills and understanding, ranging from the physics of semiconductor devices, fibres and passive optical components, through to the design of communication networks, not forgetting the continuing requirement for high speed electronic circuitry.

Inter-campus exchanges available

China and Malaysia

BEng/MEng Electronic and Communications Engineering (H690/H640)

<table>
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<tbody>
<tr>
<td><strong>Core modules:</strong></td>
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<tr>
<td>• Introduction to Circuits and Fields</td>
<td>• Computer Communications and Networks</td>
</tr>
<tr>
<td>• Introduction to Electronic Engineering</td>
<td>• Signal Processing and Control Engineering</td>
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<tr>
<td>• Introduction to Communications Engineering</td>
<td>• Telecommunications</td>
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<tr>
<td>• Introduction to Computer Engineering</td>
<td>• Electronic Engineering Design Project</td>
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<tr>
<td>• Introduction to Electrical Engineering</td>
<td>• Electronic Engineering Design</td>
</tr>
<tr>
<td>• Introduction to Real-Time Systems</td>
<td>• Professional Skills for Electrical and Electronic Engineers</td>
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<tr>
<td>• Laboratory and Presentation Skills A</td>
<td>• Electronic Construction Project</td>
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<td>• Engineering Mathematics 1</td>
<td>• Probabilistic and Numerical Techniques for Engineers</td>
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<tr>
<td>• Engineering Mathematics 2</td>
<td>• Mathematical Techniques for Electrical and Electronic Engineers 1</td>
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</tbody>
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<tr>
<th>Year one</th>
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<tbody>
<tr>
<td><strong>Core modules:</strong></td>
<td><strong>Core modules:</strong></td>
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<tr>
<td>• Third-Year Project</td>
<td>• Digital Communications</td>
</tr>
<tr>
<td>• Digital Communications Systems</td>
<td>• Industrial Awareness</td>
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<tr>
<td>• Digital Video Communication Systems</td>
<td>• Fields, Waves and Antennas</td>
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<tr>
<td>• Microwave Communications</td>
<td>• Group Project</td>
</tr>
<tr>
<td>• Business Planning for Engineers</td>
<td>• Digital Video Communication Systems</td>
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<tr>
<td>• Microwave Communications</td>
<td>• Microwave Communications</td>
</tr>
<tr>
<td>• Engineering Software: Design</td>
<td>• Microwave Communications</td>
</tr>
<tr>
<td>• Embedded Computing</td>
<td>Optional modules include:</td>
</tr>
<tr>
<td>• IT Infrastructure</td>
<td>• HDL for Programmable Logic</td>
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<tr>
<td>• Engineering Software: Design and Implementation</td>
<td>with Project</td>
</tr>
<tr>
<td>• Control Systems Design</td>
<td>• HDL for Programmable Logic</td>
</tr>
<tr>
<td>• Electronic Design</td>
<td>• Bioelectronic and Biophotonic Interfacing</td>
</tr>
<tr>
<td>• Solid State Devices</td>
<td>• Digital Signal Processing for Telecommunications,</td>
</tr>
<tr>
<td>• VLSI Design</td>
<td>• Multimedia and Instrumentation with Project</td>
</tr>
<tr>
<td>• Fields, Waves and Antennas</td>
<td>• Advanced Control System</td>
</tr>
<tr>
<td>• Telecommunication Electronics</td>
<td>Design with Project</td>
</tr>
<tr>
<td>• Web-Based Computing</td>
<td>• Instrumentation and Measurement</td>
</tr>
<tr>
<td>• Embedded Computing</td>
<td>• Digital Signal Processing for Telecommunications,</td>
</tr>
<tr>
<td>• IT Infrastructure</td>
<td>• Multimedia and Instrumentation</td>
</tr>
<tr>
<td>• Engineering Software: Design and Implementation</td>
<td>• Advanced Control System</td>
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</tbody>
</table>

Optional modules include:

• RF Microelectronics
• RF Microelectronics with Project
• Photonic Communications Components
• HDL for Programmable Logic with Project
• HDL for Programmable Logic
• Bioelectronic and Biophotonic Interfacing
• Digital Signal Processing for Telecommunications,
• Multimedia and Instrumentation with Project
• Advanced Control System Design with Project
• Instrumentation and Measurement
• Digital Signal Processing for Telecommunications,
• Multimedia and Instrumentation
• Advanced Control System Design
• Instrumentation and Measurement with Project
• Mobile Communications
• Optical Communications and Networks
• Mobile Communications with Project
The applications of microprocessors and DSPs are almost unlimited and are integral to modern systems engineering. For instance, DSPs are found at the core of an everyday device that uses audio signal processing, digital image processing, speech recognition and digital communications – namely your mobile phone. Other examples are equalisation of sound in surround sound equipment, weather forecasting, economic forecasting, seismic data processing, analysis and control of industrial processes, computer-generated animations in movies, medical imaging such as CAT scans and MRI, image manipulation, and audio effects for use with electric guitar amplifiers – DSPs are also essential to virtual reality systems.

Potential career paths
The electronic and computer engineering degree course includes a number of modules which introduce the technology related to microprocessor applications.

The role of microprocessors and digital signal processors (DSPs) in the real world is to take measurements, process information or to output signals. Often concentrating on audio and digital signals or speech processing, they require special electronic circuitry and real-time systems programming.

### BEng/MEng Electronic and Computer Engineering

Computer technology can be found in more than just desktop and laptop PCs. Specialist microprocessors are used for communications (there’s one in your mobile phone), measurement devices (such as medical instrumentation), and entertainment (HD and 3D TV) to name just a few.

This degree is designed for students who have an interest in computers, computing systems and software. Directed specialisms for modules and projects include microelectronics and very-large-scale integration (VLSI) design, object oriented software, computer networks and other modules offered by the School of Computer Science.

Final-year projects provide students with the chance to work with members of the research groups working on the latest advances in VLSI applications for computer systems, parallel and embedded architectures, digital signal and vector processing.

Graduates with a degree in electronic and computer engineering can find careers in many branches of home and industrial electronics and computing – the choice is almost limitless.

### Potential career paths

- Electronic and computer engineering can be found in more than just desktop and laptop PCs.
- Specialist microprocessors are used for communications, measurement devices, and entertainment.
- This degree is designed for students with an interest in computers, computing systems, and software.
- Projects provide students with the chance to work with members of research groups.
- Graduates can find careers in various fields.

### Inter-campuses exchanges available

- China and Malaysia

### Core modules

- Introduction to Circuits and Fields
- Introduction to Electronic Engineering
- Introduction to Communications Engineering
- Introduction to Computer Engineering
- Introduction to Electrical Engineering
- Introduction to Real-Time Systems
- Laboratory and Presentation Skills A
- Engineering Mathematics 1
- Engineering Mathematics 2

### Year one

- Core modules:
  - Third-Year Project
  - Web-Based Computing
  - Embedded Computing
  - IT Infrastructure
  - Engineering Software: Design and Implementation
  - Business Planning for Engineers
  - Group Project

- Optional modules include:
  - Control Systems Design
  - Electronic Design
  - Solid State Devices
  - VLSI Design
  - Fields, Waves and Antennas
  - Telecommunication Electronics

### Year two

- Core modules:
  - Computer Communications and Networks
  - Signal Processing and Control Engineering
  - Telecommunications
  - Electronic Engineering Design Project
  - Electronic Engineering
  - Software Engineering Design
  - Professional Skills for Electrical and Electronic Engineers
  - Electronic Construction Project
  - Probabilistic and Numerical Techniques for Engineers
  - Mathematical Techniques for Electrical and Electronic Engineers

- Optional modules include:
  - RF Microelectronics
  - RF Microelectronics with project
  - Photonic Communications Components
  - HDL for Programmable Logic Interfacing
  - Digital Signal Processing for Telecommunications
  - Multimedia and Instrumentation with Project
  - Advanced Control System Design with Project
  - Instrumentation and Measurement
  - Digital Signal Processing for Telecommunications
  - Multimedia and Instrumentation
  - Advanced Control System Design
  - Instrumentation and Measurement with Project
  - Mobile Communications
  - Optical Communications and Networks
Major/minor honours

BEng/MEng Electrical and Electronic Engineering with Management

Many of our students like a fast-track route into management and related disciplines such as marketing, sales and finance while maintaining a strong technical background. This degree was created specifically for them.

All the degrees offered by the department provide an understanding of how a company is structured, how it runs financially and its legal responsibilities. However, if you wish to learn more about these aspects, as well as management methods, the stock market, marketing, accountancy and sales techniques, then this degree is for you.

This degree comprises a broad range of electrical and electronic modules taken from the single honours degree programme. These topics include electronic design, communications, software engineering, computer modelling, microelectronics, power generation and distribution, electrical machines, signal processing, renewable energy systems, instrumentation and many more. The choice is supplemented by additional management related topics available from our internationally renowned Business School.

A quarter of the work in your final year will be management related and your project will have a substantial component relating to a management, financial or marketing activity.

Inter-campus exchanges available
China and Malaysia

BEng/MEng Electrical and Electronic Engineering with Mathematics

Advanced mathematical concepts are used in all areas of electronic and electrical engineering. Students on this degree develop an appreciation of the mathematical principles that underpin electronics, and the physical principles that inform applied mathematics.

This degree comprises a broad range of electrical and electronic modules taken from the single honours degree programme. These topics include electronic design, communications, software engineering, computer modelling, microelectronics, power generation and distribution, electrical machines, signal processing, renewable energy systems, instrumentation, and many more. It also includes the opportunity to study the type of advanced mathematical techniques prized by many engineering industries. A dedicated stream of modules throughout the degree includes topics such as vector calculus, differential equations and Fourier analysis, computerised mathematical methods in engineering, electromagnetism and nonlinear waves.

The degree course appeals to those with a flair for mathematics and an interest in applying mathematical skills in a variety of engineering applications. There is always a high demand from employers for engineers with an advanced mathematical ability.

Inter-campus exchanges available
China and Malaysia (second year only)

BEng/MEng Electrical and Electronic Engineering with Management (H6NB/H6NG)

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<th>Year three</th>
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<td>• Introduction to Marketing</td>
<td>• Human Resource Management I</td>
<td>• Industrial/Research Orientated Project</td>
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<td>• Introduction to Circuits and Fields</td>
<td>• People and Organisations</td>
<td>• Human Resource Management II</td>
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<td>• Introduction to Electronic Engineering</td>
<td>• Signal Processing and Control Engineering</td>
<td>• Group Project</td>
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<td>• Introduction to Communications Engineering</td>
<td>• Telecommunications</td>
<td>• Optional modules available in both engineering and business</td>
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<tr>
<td>• Introduction to Electrical Engineering</td>
<td>• Power Supply Electronics</td>
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<tr>
<td>• Laboratory and Computer Skills</td>
<td>• Electronic Engineering</td>
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<tr>
<td>• New Venture Creation</td>
<td>• Software Engineering Design</td>
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<tr>
<td>• Engineering Mathematics 1</td>
<td>• Electrical Engineering Design Project</td>
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<td>• Engineering Mathematics 2</td>
<td>• Mathematical Techniques for Electrical and Electronic Engineers</td>
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BEng/MEng Electrical and Electronic Engineering with Mathematics (H6GC/H6G1)

<table>
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<td>• Vector Calculus</td>
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<td>• Introduction to Circuits and Fields</td>
<td>• Differential Equations and Fourier Analysis</td>
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<td>• Introduction to Electronic Engineering</td>
<td>• Signal Processing and Control Engineering</td>
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<td>• Introduction to Communications Engineering</td>
<td>• Telecommunications</td>
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<td>• Introduction to Electrical Engineering</td>
<td>• Power Supply Electronics</td>
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<td>• Engineering Mathematics 1</td>
<td>• Electronic Engineering</td>
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<tr>
<td>• Engineering Mathematics 2</td>
<td>• Software Engineering Design</td>
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<td>• Professional Skills for Electrical and Electronic Engineers</td>
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<td>• Electrical Engineering Design Project</td>
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<td>• Electronic Construction Project</td>
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BEng | MEng

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<td>Core modules:</td>
<td>Core modules:</td>
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<tr>
<td>• Third-Year Project</td>
<td>• Control Systems Design</td>
<td>• Industrial/Research Orientated Project</td>
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<td>• Business Planning for Engineers</td>
<td>• Industrial Awareness</td>
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<td></td>
<td>• Fields, Waves and Antennas</td>
<td>• Optional modules available in both engineering and business</td>
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How will I study?

Teaching methods
As a student on our courses, you will work with a diverse group of lecturers, passionate about the subjects they teach, and this is reflected in the modules available. We also benefit from having our industrial contacts come to give guest lectures about aspects of industrial practice, particularly in years three and four as you start to specialise.

Students are taught through lectures, problems classes and tutorials together with laboratory based experiments or project work. The problems classes and tutorials provide weekly access to lectures in a small-class format to answer your questions and clarify issues raised in lectures. You will also see real-life practice through a series of visits to important industrial sites.

In the first year we set progress tests every fortnight. The results of these tests highlight the areas where individuals or classes are unsure about a topic, and allow us to organise extra help in that area.

Laboratory work helps you to develop construction skills, and teaches you to use the most advanced test and measurement equipment and industry standard software such as Matlab and Spice. Project work (whether lab or computer-based) is the best way to develop and practise your problem solving skills and also provides experience of working in teams – something you will go on to do as a qualified engineer.

You will have a full timetable with around 15 hours each week in lectures, classes and tutorials, and another three to six hours each week in the laboratory. This high number of contact hours reflects how the course builds from concept to concept and how we aim to develop you into a professional engineer. The rest of the time, you will be working independently, doing the necessary background reading, course and project work, and report writing.

The department also has an active Learning Community Forum where student representatives from each year group take part in regular meetings with academic staff, where they are able to give their views on courses, modules, laboratory sessions and general University life.

In the final year of your degree you will undertake a major individual project supervised by a member of our academic staff. The topic for this will reflect both your interests and the degree you are studying. You will have regular meetings with your supervisor to ensure a successful outcome to your work. This project is a key part of your development as an independent engineer.

In addition to the engineering skills you will acquire, you will be taught a number of generic communication skills such as report writing, verbal presentations, poster presentations, and web page design. You will also learn how companies are structured, how they operate financially, and their legal and other responsibilities.

Most MEng students attend a unique course called Industrial Awareness, which is run as a series of one-day workshops on various aspects of company practice, for example intellectual property (patents and copyright) and financial management. These workshops are very popular with students as they are run by practising managers/engineers invited from industry.

Key Information Sets
Key Information Sets (KIS) are comparable sets of information about full or part-time undergraduate courses and are designed to meet the information needs of prospective students. All KIS data is published on the Unistats website: www.unistats.co.uk

For Nottingham’s KIS data, please see individual course entries at www.nottingham.ac.uk/ugstudy
How will I be assessed?

All undergraduate degree programmes in the University are modular, which means you undertake modules of study with assessment at the end of each semester.

Assessment methods
We employ a variety of assessment methods. Most modules are assessed by a single exam (usually lasting one and a half to two hours), and many also incorporate coursework in the form of a report describing a project assignment.

Project-based modules are assessed by one or more reports, in some cases written jointly with group members.

The final-year project (worth 25% (BEng) or 33% (MEng) of the final-year mark) is assessed by a combination of written thesis, oral examination and presentation.

Project work, assessments and feedback in tutorial sessions are vital for students’ understanding about how different aspects of the curriculum interlink, and this will help you understand the practical context for the skills and knowledge you are developing.

The teaching year
The teaching year is divided into two semesters. The first semester lasts for 14 weeks, with 12 weeks for teaching and revision and two weeks for assessment. The second semester follows the same pattern, but there are an additional two weeks at the end to complete the assessment process and to enable returning students to discuss their results with tutors and begin to plan the next session’s work.

Although the teaching year is divided into two semesters for organisational purposes, this is fitted into the traditional pattern of three terms: one before Christmas; one between Christmas and Easter; and one after Easter.

“Our flexible course structure allows you to learn about the different disciplines within the broad range of electrical and electronic engineering before deciding on your final course of study. In most cases, you can swap between courses at the end of the first and second years”

Professor Mark Sumner
Director of Undergraduate Admissions
The University of Nottingham is a truly international university with campuses in the UK, Malaysia and China. The Faculty of Engineering seeks to emulate this philosophy by offering our students the opportunity to participate in exchange programmes all over the world. The faculty is constantly working to ensure our graduates gain an advantage when they go into the job market; we see study abroad as another way to make our graduates stand out from the crowd.

Studying abroad provides students with the unique opportunity to:

• see your academic subject from a different perspective in a new academic environment
• acquire invaluable life skills
• meet a wide variety of people and make an international network of friends
• discover new strengths and abilities, conquer new challenges and solve new problems
• gain global awareness to prepare yourself for a career abroad

The faculty participates in the following exchange schemes:

• Universitas 21 (U21)/University-wide exchange
• inter-campus exchange to China and/or Malaysia
• Erasmus exchange

These cover institutions from America, Australia, Canada, Germany, the Netherlands, New Zealand, Singapore and Sweden. Your choice of exchange partner will depend on your department and the course you are registered on. Eligibility for exchange schemes will also depend upon meeting academic criteria.

Inter-campus exchange

Malaysia

The University of Nottingham Malaysia Campus (UNMC) opened in September 2000 to become the first branch campus of a British university in Malaysia and one of the first in the world. A friendly atmosphere, world-class teaching and extensive facilities make it a popular choice for Malaysian and international students, as well as exchange students from Nottingham; with more than 5,000 students from over 70 countries.

The Malaysia Campus is situated near the town of Semenyih, a 45-minute drive from the capital Kuala Lumpur. Occupying a scenic position overlooking green hills on a 101-acre site, and designed to mirror the attributes of University Park Campus in the UK, the campus is a self-contained and self-sufficient neighbourhood village in a garden environment.

China

In 2004, Nottingham was the first foreign university to establish a campus in China. The University of Nottingham Ningbo China (UNNC) offers the same high standard of teaching as the UK campuses and has internationalisation at its heart: of more than 6,000 students, there are around 300 international students from at least 55 countries.

The China Campus is situated in Ningbo, a city of over five million people situated on the east coast of China. Ningbo is less than two hours by train from Shanghai and the campus at Ningbo provides accommodation, sports facilities and a shopping street.

For those courses where inter-campus exchange is available, it is indicated on the course page in this brochure.

If you do decide to apply to study abroad, the University’s International Office will offer support from the application stage right through to your return to the UK, with advice on everything from immigration to possible sources of financial support. Find out more:

www.nottingham.ac.uk/studyabroad
Career and employment prospects

The University of Nottingham is consistently named as one of the most targeted universities by Britain’s leading graduate employers*. Our degrees open up a whole world of opportunity and prospects. Many students pursue fantastic careers in engineering, while others enter the management and commerce sector, or software and IT. Others also continue their studies with further education.

There are many opportunities to pursue a year in industry. Students may postpone a year of their course and spend the year working in industry which allows them to apply knowledge gained in academic studies to problem solving in a ‘real life’ industrial situation – and they graduate with engineering work experience. The faculty has a dedicated Industrial Placement Team who can help you in finding a placement. For more information see www.nottingham.ac.uk/engineering/industrialplacement

It is our priority to prepare you for future success. Each year we organise an exclusive annual careers event specifically for electrical and electronic engineering students. The following companies are typical of those attending to recruit our students: Atkins; British Nuclear Group; Control Techniques Ltd; DESG; John G Peck Ltd; Lintott Control Systems; Matchtech Group plc; Metronet Rail; Royal Navy; Royal Marines; Siemens; Spirent Enterprises Ltd; Royal Air Force; BAE Systems; National Grid UK; and Texas Instruments.

Graduate employment
In 2014, 86.7% of first-degree graduates in the Department of Electrical and Electronic Engineering who were available for employment had secured work or further study within six months of graduation.

The average starting salary was £26,900 with the highest being £32,000.**

The University’s Careers and Employability Service
Our Careers and Employability Service, which is based on University Park Campus, offers an extensive range of careers-oriented services, including CV-writing sessions, interview advice, presentations by major employers and general career advice. As a University of Nottingham graduate, you will receive lifelong support from the service. This means that you can ask a careers adviser to look over your job application in person, by email or Skype and you can also access a database of graduate vacancies.

For more information see www.nottingham.ac.uk/careers/engineering

The Nottingham Advantage Award
The University’s Advantage Award is a programme of activities developed to recognise and reward extracurricular responsibilities. It allows you to gain recognition for participating in a wide range of activities accredited by the University and delivered by top graduate employers, professional services and members of staff of the University. It also shows employers that you have gone above and beyond your degree and gained valuable transferable skills. For further information, please visit www.nottingham.ac.uk/careers/advantage

** Known destinations of full-time home and EU first-degree graduates, 2013/14
*** Figure based on H600 course, unistats.direct.gov.uk
Research excellence underpins and animates all of our teaching in the Department of Electrical and Electronic Engineering. Interdisciplinary work in the department ranges from collaborative research at the science-engineering interface, through fundamental studies in enabling technologies, to applied research in partnership with industry.

The department offers the following postgraduate taught courses:

- MSc Bioengineering
- MSc Bioengineering: Imaging and Sensing
- MSc Electrical and Electronic Engineering and Entrepreneurship
- MSc Electrical and Electronic Engineering
- MSc/PGDip Electrical Engineering for Sustainable and Renewable Energy
- MSc Electrical Engineering
- MSc/PGDip Electrical Transportation Systems and Infrastructure
- MSc (by Research) Electromagnetics Design
- MSc/PGDip Electronic Communications and Computer Engineering
- MSc Modern Telecommunications
- MSc/PGDip Photonic and Optical Engineering
- MSc/PGDip Power Electronics and Drives
- MSc Power Electronics, Machines and Drives (part-time)
- MSc Sustainable Transportation and Electrical Power Systems (two year Erasmus Mundus)
- MSc (by Research) Biophotonics
- Pre Masters Programme (one year) leading to MSc in the Department of Electrical and Electronic Engineering MSc

For information about our taught masters courses please see [www.nottingham.ac.uk/pgstudy](http://www.nottingham.ac.uk/pgstudy)

For information about our research opportunities please see [www.nottingham.ac.uk/engineering/research](http://www.nottingham.ac.uk/engineering/research)
“My final-year project has been my favourite part of the course as I have been able to apply all the skills and knowledge from the past three years to a project I’m passionate about. I have been designing, building and programming a circuit board. This project has given me a lot of independence but I still have the support of my project supervisor. I feel like I’ve really accomplished something.”

Helena Andreou/MEng Electrical and Electronic Engineering (fourth-year)
Your student experience

You’ve read lots about the degree programme you’re interested in, now it’s time to explore life outside the lecture theatre. There’s so much for you to get involved in and explore at the University and around the city. We are proud to be one of the leading universities for student experience in the UK*, which will ensure that you have a university experience you’ll never forget.

Your University of Nottingham – at home and around the world

We are proud of our stunning campuses and are continually investing in our grounds, buildings and amenities to ensure that you only have the best surroundings in which to live and study. Our main UK campuses have a mix of state-of-the-art facilities, including sports centres, places to eat and excellent learning facilities on every campus.

We’ve made getting from campus to campus as easy as possible and students can benefit from our free inter-campus Hopper Bus, so you’re never far away from the striking architecture and innovative technology of Jubilee Campus, the rolling parkland and period buildings at University Park, or the cutting-edge features of Sutton Bonington.

The University of Nottingham is Britain’s global university with campuses in the UK, China and Malaysia. We also have links with more than 300 universities in over 40 countries, adding a truly global flavour to your degree and giving you the chance to explore the world. Find out more: www.nottingham.ac.uk/about/campuses

Your new home from home

At Nottingham we offer a range of different accommodation options, rooms are available as single or shared, en suite or shared bathroom, all the way through to studio flats, and vary from self-catered to fully catered (19 meals per week). We also offer a guarantee of University accommodation for one year to all new full-time undergraduate students, subject to the following conditions: you firmly accept your course place at Nottingham, accept your offer of accommodation by the deadline given in your offer letter, and have an unconditional status no later than 31 August in the year you intend to begin your studies. If you are a new, full-time undergraduate student who is classified as international for fee purposes, this guarantee applies for three years**. For more information, including a breakdown of pricing, see www.nottingham.ac.uk/accommodation

Your support network

Throughout your university journey there will be numerous people on hand to support you, including tutors and dedicated staff who will be able to advise you on various aspects of life as a student. We have Student Services Centres on all three of our UK campuses, which provide a range of support, information and specialist services to enhance your student experience. This support includes:

• Academic Support – can provide practical advice on areas of academic study; the service also provides specialist academic support for students with dyslexia, dyspraxia and other specific learning difficulties
• Disability Support – coordinates support and access arrangements for students with a disability or long-term medical condition
• Financial Support – provides information on the sources of finance available from government agencies and the University itself, and gives advice about financial matters
• Student Services – also advise on issues ranging from childcare, counselling and health to international student support, chaplaincy and faith support, as well as offering advice on paying your tuition and accommodation fees

Whatever you may need support with, they will either be able to help or point you in the direction of someone who can. Find out more: www.nottingham.ac.uk/studentservices

** Providing you submit your returners’ application in line with the requirements of the accommodation providers.
Getting involved in your Students' Union
As soon as you start at The University of Nottingham, you are automatically enrolled as a member of our Students’ Union, which is considered to be one of the best in the country. There are hundreds of activities that you could be part of, providing you with the perfect opportunity to take up a new hobby or pursue existing interests. Choose from over 200 student-run societies, covering all interests and abilities, as well as local and national volunteering projects, to which you can commit as much or as little time as you wish.

Our Students’ Union is home to a number of award-winning student-run media groups, which give you the chance to gain practical work experience both behind the scenes or centre stage as a presenter, actor or journalist. The Nottingham New Theatre, Impact magazine, Nottingham Student Television (NSTV) and University Radio Nottingham (URN) have all been recognised as the best in their field, winning a clutch of awards for outstanding achievements.

However you decide to become involved in the Union, you can be sure you will make new friends and learn new skills, all while having a lot of fun! Find out more: www.su.nottingham.ac.uk

Sports
We offer sport at all levels and an excellent all-inclusive student membership offer, so whether you enjoy sport as a hobby or are an elite athlete we will have just what you need. We have over 70 sports clubs, which means we have the 2nd highest number of sports clubs of any UK university. If you’re not interested in joining a team but want to stay fit, we have sports centres on all of our main UK campuses. Find out more: www.nottingham.ac.uk/sport

Exploring your new city
With Nottingham city centre just a 10-minute bus ride away from University Park Campus, our students are always close to the action. Buses run through campus regularly and many run late-night services too, which is handy if you’re a night owl.

For music lovers, you can take your pick from the world-famous Rock City, Capital FM Arena or one of the smaller gig venues for a more intimate live show. Nottingham is rich in performance venues, with comedy clubs and theatres catering for lovers of drama, musicals, ballet and panto.

We are very proud of our sporting heritage, and with football clubs Nottingham Forest and Notts County in the city, as well as Trent Bridge cricket ground and the National Ice Centre on your doorstep, you might just become a sports fan if you’re not one already.

History and culture can be found in all corners of the city, with Nottingham Castle, Nottingham Contemporary arts centre, the Galleries of Justice Museum, Nottingham Lakeside Arts (the University’s public arts centre located on our University Park Campus), art house cinemas and three of the world’s oldest pubs all providing points of interest. If you enjoy shopping, Nottingham is perfect for you; independent boutiques and vintage shops in the bohemian area of Hockley mix with high street names in our large shopping centres to make Nottingham a veritable shopping haven.

Find out more: www.nottingham.ac.uk/nottinghamlife

Download our city guide: www.nottingham.ac.uk/go/cityguide
Applying for a place

We are looking for students who have the ability and motivation to benefit from our courses, and who will make a valued contribution to the department and the University. Candidates for full-time admission are considered on the basis of their Universities and Colleges Admissions Service (UCAS) form. For more information on how to make your application stand out, have a look at our online prospectus: www.nottingham.ac.uk/ugstudy/applying/applicationprocess

Application process
All applications for an undergraduate place to study at The University of Nottingham (including applications by overseas students) must be made through UCAS. Applications should be made online at www.ucas.com. Candidates will be notified of decisions through UCAS Track at www.ucas.com.

Note: Our first year is common to most of our courses. You only need to apply for one course, even if you are considering two or three.

Entry numbers
For information on how many students the department plans to admit on each course, please see the table on page 9.

The selection procedure
Selection of those applicants to whom we will make an offer, will be based upon a combination of the candidate’s academic record and an assessment of all the information provided in their UCAS application form, their academic reference and their personal statement.

Studying engineering requires a blend of maths and science; design is often a significant component (particularly computer-based), and is a good career path for focussed, motivated problem solvers. You should try to provide evidence of these qualities and your reasons for choosing your selected course in your personal statement. All applicants will be invited to a visit day to discuss their application with a member of academic staff.

Academic attainment
Our minimum A level requirements are detailed on page 9.

Required subjects
All courses: A level or 5 at Higher Level (IB) in maths and an electronics/science subject (typically physics, chemistry, biology or electronics but others may be considered).
General studies, critical thinking or citizenship studies are not accepted.

Alternative qualifications
In this brochure you will find our A level entry requirements but we accept a much broader range of qualifications. These include:
• Access to HE Diploma
• Advanced Diploma
• BTEC HND/HNC
• BTEC Extended Diploma
• Cambridge Pre-U
• International Baccalaureate
• Irish Leaving Certificate
• Scottish Advanced Highers
• Welsh Baccalaureate Advanced Diploma

This list is not exhaustive; we will consider applicants with other qualifications on an individual basis. The entry requirements for alternative qualifications can be quite specific; for example you may need to take certain modules and achieve a specified grade in those modules. Please contact us to discuss the transferability of your qualification.

Flexible admissions policy
In recognition of our applicants’ varied experience and educational pathways, we employ a flexible admissions policy. If we judge that your situation has adversely affected your achievement, then we will consider this when assessing your academic potential. If you wish to mention information about your experiences in your personal statement, then you should ask the teacher or tutor writing your reference to confirm what you have written. We may ask for further evidence and may consider a range of factors. For more information, please see www.nottingham.ac.uk/go/admissionspolicies

Mature applicants
We encourage applications from mature students (which means all those aged 21 or over when the course begins). You should apply in the normal way through UCAS (unless you want to study part-time, in which case you should apply directly to the department). While we accept a range of qualifications, you should check our specific requirements on UCAS course entry profiles. If in doubt, please contact the admissions tutor, who will be happy to answer any specific queries you have about applying as a mature student. Please email your questions to eng-student-support@nottingham.ac.uk

For more information about being a mature student, please see www.nottingham.ac.uk/mature

International applicants
We welcome applications from international students and have students from many parts of the world studying with us at undergraduate and postgraduate level. All international candidates for undergraduate courses should apply through UCAS. The University’s International Office offers guidance and advice on matters such as visa and immigration regulations, working and living in the UK, entry requirements and preparing for coming to Nottingham – and arranges a Welcome Programme for new international students each September. If you would like to visit the University and are unable to attend an open day, the International Office will be happy to arrange an individual visit for you. For further information please visit www.nottingham.ac.uk/studywithus/international-applicants

English language requirements
IELTS 6.0 (no less than 5.5 in each element).

Preparing to study in English – academic English preparation and support
The University of Nottingham Centre for English Language Education (CELE) offers high-quality academic English and study skills (presessional) programmes to prepare you to study your degree in English. Our programmes are designed to give international students excellent preparation for their academic studies and are taught by experienced, professional tutors.

CELE provides a range of programmes throughout the year, including five-week subject-specific courses (in some subjects) and a four-week course in September for students with unconditional offers, with a focus on academic study skills.

You can continue to benefit from academic English support with free classes and one-to-one consultations throughout your study (insessional programmes).

For more information about CELE, please visit www.nottingham.ac.uk/cele

Deferred entry
Applicants who wish to defer their entry by a year will not be at a disadvantage. Please tell us something about your plans for your gap year in your UCAS personal statement.

Equal opportunities policy
The University aims to create the conditions whereby students and staff are treated solely on the basis of their merits, abilities and potential, regardless of gender, race, colour, nationality, ethnic or national origin, age, socio-economic background, disability, religious or political beliefs, trade union membership, family circumstances, sexual orientation or other irrelevant distinction.

For tips and advice at every step of your application journey, visit our undergraduate applicants’ area: www.nottingham.ac.uk/ugapplicants

For more information about being a mature student, please see www.nottingham.ac.uk/mature

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Frequently asked questions

What staff support is available during the course?
The department runs an academic tutorial system. First-year students see their tutor on a weekly basis. In later years tutors advise on module/course choices and career options. Personal tutors are also available to advise on other, non-course related challenges encountered at university.

Can I switch between courses?
You can switch between most courses in the Department of Electrical and Electronic Engineering at the end of the first year. You can switch between BEng and MEng degrees any time in the first two years of study.

Can I take a year in industry?
You will be encouraged to undertake industrial placements, usually at the end of year two or year three (MEng). Between September and December the larger industry-based organisations come to the department to recruit students for industrial placements and department staff use their extensive industrial links to provide placement opportunities for students. The Faculty's dedicated Industrial Placement Team can help students find a placement. For more information please see www.nottingham.ac.uk/engineering/industrialplacement

We also have the Year in Industry scheme which is a not-for-profit organisation that provides placements for students. They have an office within the Faculty of Engineering and a website: www.yini.org.uk

How much practical work will I do?
Practical work is an integral part of the course and includes laboratory, field work and industrial visits. We use labs to develop analytical, problem-solving and team-working skills. The amount of practical work undertaken is high in the first year: typically 30% of the course.

I haven't studied the correct subjects – is there any way I can do engineering?
If you have not studied maths, or a science at A level you could consider applying for the Engineering Foundation Year Programme. For more details, please see www.nottingham.ac.uk/foundationyear

What support do you offer for students with disabilities or dyslexia?
We are committed to promoting access for students who have a disability, dyslexia or a long-term medical condition. Services provided by the University aim to enable students to fulfil the inherent requirements of the course as independently as possible. The University’s Disability Statement, which lists services, facilities and opportunities available throughout the University can be viewed at www.nottingham.ac.uk/disability

What support is available for students with children?
There are a range of services provided to support students with children, including a University day nursery, a playscheme and playcentre day care. There is also a scheme to help students fund childcare. For more information, see www.nottingham.ac.uk/child-care

How much are the fees?
Like many universities in England, Nottingham charges full-time UK and EU students an annual tuition fee of £9,000. However, you will not have to pay your fees while studying – the government will lend eligible students the money, which you will start to pay back once you have left university and are earning at least £21,000. For more information, please see www.nottingham.ac.uk/fees

Fees for students from outside the EU vary from subject to subject. For more information, please see the ‘New international students’ section on www.nottingham.ac.uk/fees

What bursaries and scholarships are available?
Although bursary figures for 2016/17 are yet to be finalised, the University will continue to offer a generous package of bursary support to students from lower income households. These are in addition to any support you may receive from the government. For more information please see www.nottingham.ac.uk/financialsupport or take a look at the funding tab on the relevant course entry in our online prospectus: www.nottingham.ac.uk/ugstudy

If you are an international applicant (outside of the EU), please see the ‘New international students’ section on www.nottingham.ac.uk/fees

The Faculty of Engineering offers the following scholarships:
• Top Class Entry Scholarships: £3,000 awarded as a one-off payment in recognition of academic excellence in A level (or equivalent) results for incoming students who make us their first (firm) UCAS choice.
• International Undergraduate Scholarships: £1,500 fee reduction and ongoing yearly awards for students who meet the eligibility criteria.

For more information, visit www.nottingham.ac.uk/engineering/funding

The highly successful E3 Electrical Energy Engineering Academy is an Institution of Engineering and Technology (IET) endorsed sponsorship programme for students applying to study for degrees in the Department of Electrical and Electronic Engineering. Academy scholars will benefit from a bursary of £2,500 for each year of study, eight weeks summer vacation training paid at £1,250 per month, and more. For further information, visit www.e3academy.org/scholarships.php

The UKESF Scholarship Scheme offers scholarships to students studying BEng and MEng degrees in electronics or electronic engineering at UKESF partner universities. Scholarships are open to students in any year of their degree, except the final year. For further information, visit www.ukesf.org/scholarship-scheme

Visit our website for more frequently asked questions: www.nottingham.ac.uk/faqs

To ask course-specific questions contact: eng-student-support@nottingham.ac.uk
Visiting and contacting us

Open days
If you’re considering applying to The University of Nottingham we recommend that you try to attend one of the University-wide open days, which are held in June and September each year and attract around 30,000 visitors. Find out more: www.nottingham.ac.uk/opendays

Mini open days
Mini open days are much smaller than the main open days but offer the same opportunities to attend various talks and tours as well as speak to current students and academics. Find out more www.nottingham.ac.uk/go/miniopendays or call +44 (0)115 951 5559

Virtual open day
If you can’t attend one of our open days in person, or would like to explore our campuses before visiting, take a look at our virtual open day: www.nottingham.ac.uk/virtualnottingham

UCAS visit days
Once you’ve been offered a place at Nottingham, you will be invited to attend a UCAS visit day, which is an opportunity for you to visit the department and to find out more about your chosen course. You will also be given a short tour of the campus by current students.

Other visits
If you wish to make an informal visit to the University prior to applying here, you are welcome to do so, but you should contact us in advance if you wish to visit the department or speak to an admissions tutor, and we will do our best to oblige.

Contacting us
For further information please contact:
Caroline Dolby
Engineering Student Support Team
Engineering and Science Learning Centre
University Park
Nottingham, NG7 2RD
t: +44 (0)115 951 54081
e: eng-student-support@nottingham.ac.uk
w: www.nottingham.ac.uk/eee

For international student enquiries, please contact:
The International Office
t: +44 (0)115 951 5247
f: +44 (0)115 951 5155
e: international-office@nottingham.ac.uk
w: www.nottingham.ac.uk/international

You can also connect with fellow applicants and current students on our applicants’ Facebook and Twitter pages:

The University of Nottingham has made every effort to ensure that the information in this brochure was accurate when published. Please note, however, that the nature of the content means that it is subject to change from time to time, and you should therefore consider the information to be guiding rather than definitive. You should check the University’s website for any updates before you decide to accept a place on a course.

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