



The University of
Nottingham

UNITED KINGDOM · CHINA · MALAYSIA



The University of
Nottingham

UNITED KINGDOM · CHINA · MALAYSIA



For general undergraduate
enquires contact:

The Enquiry Centre
t: +44 (0)115 951 5559
e: undergraduate-enquires@nottingham.ac.uk
w: www.nottingham.ac.uk

Revised edition October 2011

Mechanical, Materials and Manufacturing Engineering
Undergraduate Study

www.nottingham.ac.uk/m3



Contents

- 02 Welcome**
- 03 Why come to Nottingham?**
- 06 Mechanical, materials and manufacturing engineering at Nottingham**
- 07 Teaching and research excellence**
- 09 Student profile**
- 11 Our degree courses**
- 23 Graduate profiles**
- 25 Careers**
- 27 Applying for a place**
- 29 Fees and funding**
- 31 Frequently asked questions**
- 34 Visiting and contacting us**

Front cover image: Chris Rowley using a milk bottle melting rig

Third year student Emily Chruscikowski uses a pneumatic syringe for bioprinting

Welcome to the Department of Mechanical, Materials and Manufacturing Engineering

Welcome to the Department of Mechanical, Materials and Manufacturing Engineering

If you're the kind of person who sees something and wants to know just how it works, welcome to the place that will suit you down to the ground. Here at the Department of Mechanical, Materials and Manufacturing Engineering you will get hands-on in our labs and workshops, conduct investigations, and turn designs into reality.

Join us and you'll get excellent teaching from really enthusiastic people, in a friendly and supportive environment with access to leading-edge facilities.

In the latest National Student Survey, 91 per cent of students said they were satisfied with the quality of their higher education experience here in the Department (unistats.direct.gov.uk).

With a degree from The University of Nottingham you will find many doors open for you, presenting opportunities to choose from a wide range of exciting career paths, all over the world.

This brochure will show you some of these study paths and there's more information on the Department and our courses on www.nottingham.ac.uk/m3

If you have any questions not answered here, just give us a call. We look forward to welcoming you.

Professor Paul Shayler
Head of Department



Why come to Nottingham?

There are a lot of factors to consider when applying to university and some will be more important to you than others. We're proud that thousands of students apply to us every year – below are some of the reasons they give for choosing us.

An inspiring environment

With established woodland, landscaped gardens and period buildings set around a large boating lake, University Park is widely regarded as one of the most attractive campuses in the country. The University has received a record eight Green Flag Awards – the benchmark national standard for parks and green spaces in England and Wales. University Park is home to the majority of academic schools as well as several halls of residence, libraries, a sports centre, a bank, shops, cafes, bars, healthcare centre and a dental practice. There is an extensive cycle network across campus and a regular bus service to and from the city centre and between campuses. Continued investment in our engineering laboratories ensures students learn in modern, high-quality facilities. A new £10 million Engineering and Science Learning Centre will open in 2011. It will offer additional lecture theatres, seminar space and will have the latest technologies to support student self-learning.

Great career prospects

A degree from Nottingham is a statement of skill, innovation and quality. A key part of this is the value we place on research-led teaching that enables students to engage creatively with new and exciting ideas. Our students are taught by academics who are leaders in their fields of research, a unique advantage for our students who are respected and valued by employers. The employment record of our graduates is one of the best in the country. Students are able to gain professional careers advice from our award winning Centre for Career Development, gain

recognition for their extracurricular achievements through the Nottingham Advantage Award or set up their own business with the help of our EnterpriseLab.

Fantastic social scene


Extracurricular opportunities at Nottingham are plentiful. All our campuses have a strong community spirit and our Students' Union (SU) offers over 250 societies and sports clubs. It's through them that you can pursue an existing interest or take up something new with like-minded people, develop valuable skills and generally make your time at university as rewarding and memorable as possible.

A lively city

The city of Nottingham is a rich source of entertainment. Its attractions include shopping centres and boutiques, pubs and nightclubs, mainstream and independent cinemas, the Capital FM Arena, an arboretum, theatres, cafes, markets, museums and galleries. Sports fans will appreciate the ice skating rink, two football grounds, climbing centre, the national water sports centre, and an international test cricket ground and tennis centre.

Opportunities to explore the world

If you're hoping to broaden your horizons further while at university, we have the connections to help you experience new cultures first-hand. As well as exchange opportunities at our campus in Malaysia, we've developed links to more than 320 partner universities in over 40 countries. This means that as part of your degree course you could study abroad at a leading university and make new contacts and friends.



Students relax on University Park Campus, a beautiful green campus with period buildings and a large boating lake.



Harrison Poyser, second year Design Engineering student, working on a cold gas dynamic spraying machine.

Mechanical, materials and manufacturing engineering at Nottingham

The most sought-after engineers have solid professional skills, and acquiring these is a big part of the way you'll study with us. We have excellent facilities for teaching: our computer rooms and design studios have networked PCs to support Computer Aided Design (CAD) and Computer Aided Engineering (CAE) using industry-standard software (ProEngineer and 3D-Studio Max). You can also get 'hands-on' in our workshops and labs, doing investigations and experiments and turning designs into reality. Students comment that these activities are some of the best parts of their courses. Better still, employers tell us that the combination of academic study and practical, professional skills is precisely what they're looking for.

Careers

We have strong links with industrial partners including Airbus, Rolls-Royce, Ford, BP and Shell amongst many others. Engineers and designers make essential contributions to diverse sectors such as aeroengines, cars, trains, medical equipment, computer components, electronics and sports equipment. Our graduates are regularly employed by companies throughout the world. We encourage students to take industrial placements as gap years either before commencing their degree or between years two and three of the course. We work with the Year in Industry (www.yini.org.uk) who help students to find placements.

Many of our graduates start their careers in a technical role, but our courses can be a great stepping stone to things beyond your specialism. Our approach means you have the skills to progress into all kinds of areas. Graduates tend to get the pick of the careers. In fact, The University of Nottingham is one of the most popular universities among recruiters nationally. Many of our graduates go straight into highly paid consultancy or financial services positions. Equally, you may decide to go for postgraduate study either an MSc or get research work as a PhD student.

Chartered status

Being a Chartered Engineer (CEng) means having an internationally recognised professional award. It tells the world that you've followed approved academic study and had relevant training and industry experience. Our engineering degree courses are regularly reviewed and accredited by the 'Institution of Mechanical Engineers', 'The Institute of Engineering and Technology', and the 'Institution of Engineering Designers'. You can study accredited three-year BEng or four-year MEng degrees. The MEng degree can lead to CEng status after approved industrial training and experience. With a BEng degree you'll need to study further; both routes require further industrial experience to attain CEng status.

Teaching and research excellence

This is one of the premier engineering departments in the UK, combining expertise in mechanical, materials and manufacturing engineering. We have an international reputation for the high quality of our research, teaching and graduates. The Guardian rated mechanical engineering second in its university league tables in 2012.

Teaching is at the core of much of our Department's activity. Our broad spread of research-based expertise enables us to offer a unique range of undergraduate courses. Around three quarters of our students come from the UK or other EU countries. The remainder are international students from over 150 nations around the world, who bring a valuable social and cultural diversity.

Facilities

The best kit and facilities are available to work with. Our workshop has teaching lathes, and milling machines, equipped with numerical measurement readout to enhance the practical learning experience. Dedicated workshop technical staff train students in basic skills, and supervise subsequent student design project manufacturing. Once trained, students are able to use the machines in scheduled sessions to make their own designs for courseworks in later years. Students also have access to CNC machining, rapid prototyping and water jet cutting.

We regularly refurbish our labs and workshops; labs for solid mechanics, thermodynamics, fluid mechanics, vibration, control and mechatronics are integrated with manufacturing workshops, a design studio, an IT suite and project labs. For example recent new purchases include fluid mechanics laboratory equipment for observing flow patterns in small wind tunnels and for demonstrating liquid pump characteristics.

You'll have access to powerful computing networks, learning software, CAD, impressive simulation packages and more. Numerous networked computer rooms are open to you 24 hours every day. Teaching is supported by state-of-the-art lecture theatres with integrated audio visual systems, including networked computer projection for in-lecture computer-assisted learning. Much of our teaching material is supported by intranet based resources, accessible from anywhere in the world with new lecture materials in some suitable modules available as podcasts.

Tutorial system

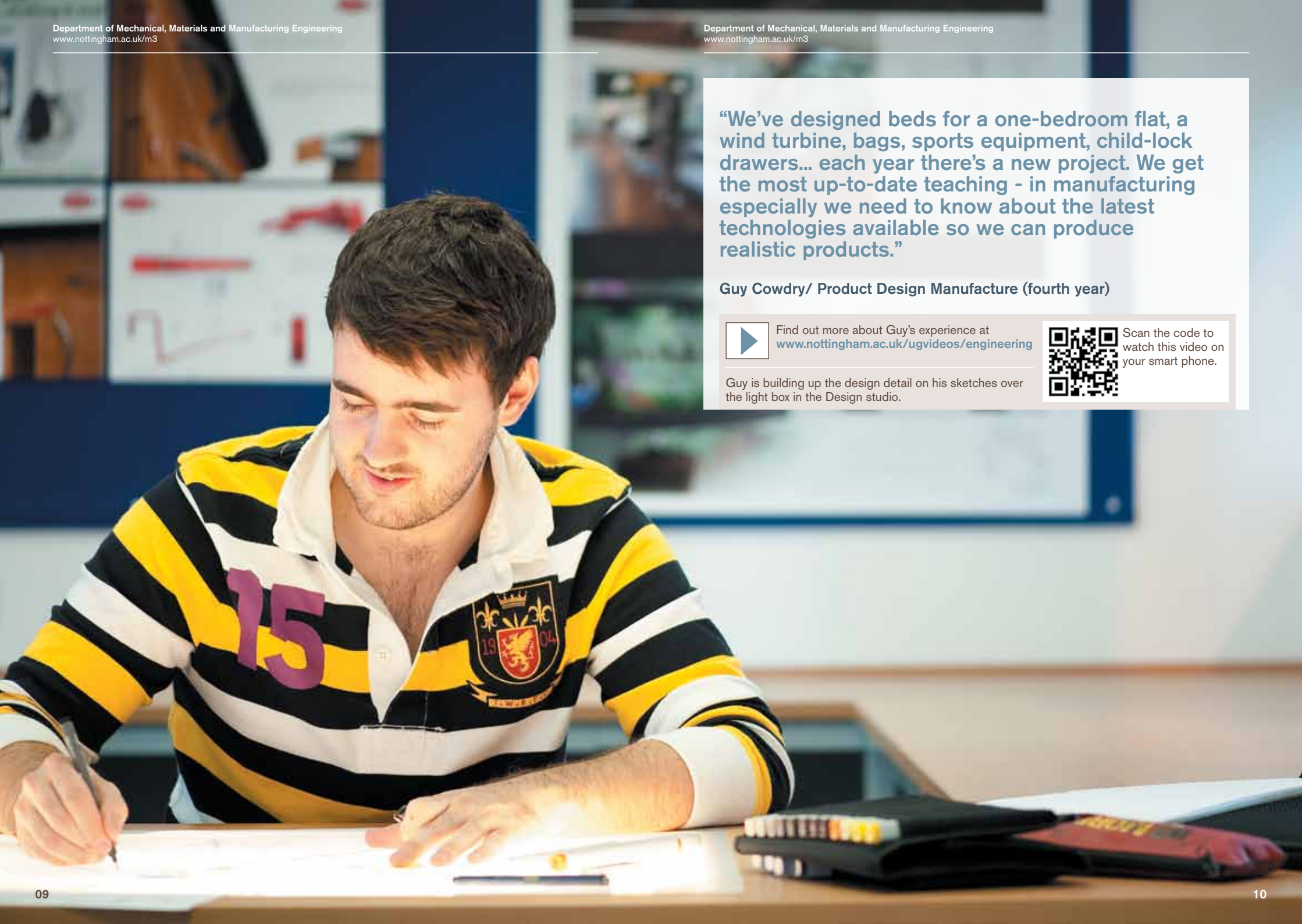
Students have a personal tutor for each year of the course, who is able to counsel and advise on matters affecting study. Our tutorial system ensures that all first year students are offered weekly meetings in a small group with a member of staff in order to help with the transition to university based work. This continues fortnightly in year two, when students are comfortably working independently in the study system, and then in years three and four the year long project supervisor is personal tutor and once again meets weekly and individually to assist with progression of project work as well as offering general support.

Research supporting teaching

Research activity within the department feeds into our teaching, in supplying lecturing staff who are practicing the theory that is taught, and in providing some of our projects for the major projects in the final two years of Masters courses. Our academic staff are involved in several research divisions in the Faculty of Engineering, working across disciplines in collaboration with numerous industrial partners, and engaging with researchers and industrial partners at institutions across Europe and globally.



Lecturer Don Giddings advises fourth year student Andrew Mitchell about his final major project.



“We’ve designed beds for a one-bedroom flat, a wind turbine, bags, sports equipment, child-lock drawers... each year there’s a new project. We get the most up-to-date teaching - in manufacturing especially we need to know about the latest technologies available so we can produce realistic products.”

Guy Cowdry/ Product Design Manufacture (fourth year)



Find out more about Guy's experience at
www.nottingham.ac.uk/ugvideos/engineering



Scan the code to
watch this video on
your smart phone.

Guy is building up the design detail on his sketches over the light box in the Design studio.

Mechanical, materials and manufacturing engineering degree courses

Degree title	Page	UCAS Code
Mechanical Engineering	13	H302 (BEng) H300 (MEng)
Product Design and Manufacture	15	H700 (BEng) H715 (MEng)
Design Engineering	17	H151 (BEng) H150 (MEng)
Manufacturing Engineering Management	19	HN72 (BEng) H716 (MEng)
Biomedical Materials Science	21	BJ85 (BSc)

Degree Courses

We offer a wide range of courses covering the main disciplines of mechanical, design, manufacture and biomedical materials. A number of courses offer specialist streams for students wishing to focus on a specialist area of interest. Emphasis is put on: real-world engineering; problem solving; communication and team work; entrepreneurship and innovation; management skills and business principles. Knowledge of business and management, team work and communication skills are all qualities employers look for in graduates.

Flexible choice

There is considerable flexibility to move between courses within the department, usually transferring at the end of year one. (This doesn't apply to the Biomedical Materials Science degree) You study in modules which earn between 10 and 40 credits. That's 120 credits per year which reflects about 1200 hours of work. In the first two years there are about 24 hours of scheduled activities per week. As you progress you have a wider choice of optional modules so you can tailor your module course to match your career plans. Modules are examined by a mix of coursework and end-of-module written examination with a module pass mark of 40 per cent.

BEng or MEng?

The BEng degree takes three years and covers all the essential material in the particular area. The MEng courses last four years and give more depth and breadth as well as an accelerated route to CEng qualification. At the end of your second year you can select whether you wish to study for BEng or MEng provided you obtain an overall mark of at least 55 per cent in your second year exams.

Study abroad

The University is part of the Universitas 21 (U21)- an international network of research intensive universities which encourages close collaboration on a wide range of initiatives including student exchanges. As an MEng student you could study with a U21 partner university in countries such as Australia, New Zealand and the USA. Our Malaysia campus offers a mechanical engineering degree programme which is identical to that at Nottingham so mechanical engineering students have an opportunity to study in Malaysia as part of their degree.

Personal support

Your personal tutor will regularly review your academic progress and help with any personal matters. Your tutor also helps you develop your skills in communication, time management and group working.

How you'll study

You'll experience teaching and learning in several forms: Lectures; practical classes in labs and workshops; Seminars and example classes; Design office classes – exploring creative solutions with staff 'consultants' (our design classes are assisted by experienced engineers from industry); Industrial visits; Individual and team-based projects; Computer-aided learning and private study. On some courses you'll also do a semester long industrial placement.

Mechanical Engineering

UCAS code: H302 (BEng) H300 (MEng)

Duration: single honours three (BEng) or four (MEng) years full-time

Entry requirements: 3 A-levels including mathematics and preferably physics (excluding general studies)

Typical A level offer: AAB (BEng)
AAA (MEng)

Typical IB score: 32-30 (BEng) 36-34 (MEng)

Other qualifications: Scottish Advanced Highers, European Baccalaureate, BTEC ND, HND and HNC

Course places: 150

Mechanical engineers apply their scientific knowledge to solve problems and design machines that help us to enjoy a better lifestyle. They work in design, development, research, consultancy, manufacture or marketing, combining technical and managerial expertise.

The core degree provides a broad foundation, whilst our specialist MEng streams provide additional scope for you to focus on an area of particular interest.

Design is the key integrating element in all years of the course. Real-world engineering, the importance of communication and team-working skills, the need to display entrepreneurship and initiative, and the relevance of appropriate management and business principles are emphasised. Engineering science and engineering design are core disciplines whilst other important

areas are mathematics, manufacturing technology, IT, electronics and control.

Typical areas of study

Years one and two

Engineering design (including materials and manufacture) – engineering science (thermodynamics, fluid mechanics, mechanics of solids, dynamics, electromechanical systems) – mathematics – IT – management.

Year three

Computer modelling techniques – management. Optional modules will allow you to follow specific themes and to develop areas of expertise and interest. MEng students can select one of the specialist streams described on the next page.

Year four (MEng only)

Advanced technology review – integrated systems analysis. Optional modules will allow you to follow specific themes and to develop areas of expertise and interest.

Project work

In year three, MEng students do a major group project. Up to four students will work as a multidisciplinary team to design, manufacture and develop a product. Starting with the design brief, which is often linked to an industry need, the group will devise and evaluate alternative design concepts, undertake the detailed engineering analysis and mechanical design, manufacture a prototype, evaluate its performance, undertake development work to improve it, and assess the financial viability and marketability of the product.

All students do an individual project in their final year. This is of an experimental, computational or analytical nature and provides a link between academic and professional work. You will be able to choose your individual project topic – most of which are based on real industrial problems.

Specialist MEng streams

Alongside the broad Mechanical Engineering degree, years three and four also offer specific streams for students wishing to focus on a specialist area of interest. You still take the core mechanical engineering modules, but you will also study 30-40 credits in your chosen specialism in each year. Your final year individual project will also be in the field of your specialist subject. The specialist topics covered by each stream include the following:

Aerospace

Aerodynamics – aerospace technology – aerospace materials – aircraft propulsion systems and aerospace manufacturing.

Automotive

Automotive technology – advanced dynamics – automotive materials – internal combustion engines.

Bioengineering

Human structure and function – cell structure and function – biomaterial structures – biomechanics – biomedical applications of materials.

Management

Entrepreneurship – accounting – operations strategy.

Modern languages

You can choose French, German, Spanish, Italian, Arabic, Japanese or Mandarin. Modules suit a range of starting levels, from raw beginner to those who already have an A level in the language.

Materials

Integrated aerospace design – design audit – transport materials – advanced materials – conservation and recycling.

Manufacture

Flexible automated manufacture – manufacturing process capability – work organisation and job design – lean manufacturing - rapid product development.

Sustainability

Energy efficiency for sustainability - sustainable manufacture - renewable generation technologies and control - advanced thermal power systems - conservation and recycling of materials - technologies for the hydrogen economy.

Product Design and Manufacture

UCAS code: H700 (BEng) H715 (MEng)

Duration: single honours three (BEng) or four (MEng) years full-time

Entry requirements: 3 A levels including mathematics (excluding general studies). design and technology or art are also desirable.

Typical A level offer: BBC (BEng)
ABB (MEng)

Typical IB score: 28 (BEng) 32 (BEng)

Other qualifications: Scottish Advanced Highers, European Baccalaureate, BTEC ND, HND and HNC

Course places: 30

Product design is an exciting profession. There is something very rewarding about seeing a product that you have designed in a store or even better being used by someone. As a product designer you are concerned with the needs of the end user, but you are also responsible for many other issues.

Design can make people's lives better and make businesses more successful. So it is important that a designer is fully prepared for a future career in a responsible profession.

This course equips you for a career in product design, industrial design or in the product development sector. The course has been developed to address the specific needs of industry to give its graduates the best possible chance of obtaining the job they want.

A graduate's ability to come up with creative solutions to design problems is of paramount importance to employers, but it is also essential that their proposed designs can be manufactured within the constraints of time, money and quality.

That is why these courses place great emphasis on the manufacturing aspects of design. There is no point designing a product that cannot be made or is too expensive to manufacture. The course values creativity whilst emphasising an understanding of manufacturing, ergonomics and materials.

The degree provides a firm understanding of design and the aesthetic and analytical approaches in developing new products.

Typical areas of study

Years one and two

Engineering design – industrial design – manufacturing methods – management – marketing – mathematics – computer modelling – design visualisation techniques – ergonomics – design for manufacture. Individual and group design projects are fundamental to the course.

Year three

Ergonomics and product design – manufacturing process capability – concurrent engineering. Optional modules will allow you to follow specific themes and to develop areas of expertise and interest.

Year four (MEng only)

Rapid product development – cognitive ergonomics. Optional modules will allow you to follow specific themes and to develop areas of expertise and interest.

Project work

Project work is an important aspect throughout the course. From year two onwards you will always have a product design project on the go. Most projects are individual, although there are some projects undertaken by groups. The final semester of both BEng and MEng degrees is the major project. This is your opportunity to demonstrate all the skills and knowledge learnt during the course. Throughout the course, projects and coursework enable students to build an impressive portfolio of work to show potential employers.

Design Engineering

UCAS code: H151 (BEng) H150 (MEng)

Duration: single honours three (BEng) or four (MEng) years full-time

Entry requirements: 3 A levels including mathematics and preferably physics (excluding general studies)

Typical A level offer: AAB (BEng)
AAA(MEng)

Typical IB score: 32-30 (BEng) 36-34 (MEng)

Other qualifications: Scottish Advanced Highers, European Baccalaureate, BTEC ND, HND and HNC

Course places: 25

What differentiates this course is its emphasis on the design process – established techniques which improve and refine and ultimately make products perform better. The course will allow you to apply engineering science to create and develop innovative solutions to open-ended problems. Real-world engineering, the importance of communication and team-working skills, the need to display entrepreneurship and initiative, and the relevance of appropriate management and business principles are all emphasised.

Typical areas of study

Years one and two

Engineering design (including materials in design and design for manufacture) – Engineering science (thermodynamics, fluid mechanics, mechanics of solids, electromechanical systems) – Mathematics – Computer Aided Engineering (CAE) – Management studies.

Year three

Ergonomics and product design – management studies. Optional modules allow you to follow specific themes and to develop areas of expertise and interest.
BEng only - Individual projects.

Year four (MEng only)

Individual design project.

Project work

All students do an individual project in their final year. This is of an experimental, computational or analytical nature and provides a link between academic and professional work. You will be able to choose your individual project topic – most of which are based on real industrial problems.

Additionally, in year three, MEng students do a major group project. Up to four students will work as a multi-disciplinary team to design, manufacture and develop a product. Starting with the design brief, normally linked to an industry need, the group will devise and evaluate alternative design concepts, undertake the detailed engineering analysis and mechanical design, manufacture a prototype, evaluate its performance, undertake development work to improve it, and assess the financial viability and marketability of the product.

Specialist MEng streams

Alongside the general Design Engineering degree, Years three and four also offer specific streams for students wishing to focus on a particular aspect of design. These involve studying 30-40 credits in your chosen specialism in each year. Your final year individual project will also be in the field of your specialist subject.

The topics covered by each stream include the following:

Mechanical

Mechanics and thermodynamics of fluids – advanced technology review – sustainability – rapid product development.

Materials

Integrated aerospace design – polymer engineering – conservation and recycling – materials in service – fibre reinforced composites.

Manufacture

Concurrent engineering – flexible automated manufacture – manufacturing process capability – lean manufacturing – rapid product development.

Manufacturing Engineering and Management

UCAS code: HN72 (BEng) H716 (MEng)

Duration: single honours three (BEng) or four (MEng) years full-time

Entry requirements: 3 A levels including mathematics and preferably physics (excluding general studies)

Typical A level offer: AAB (BEng)
AAA (MEng)

Typical IB score: 32-30(BEng) 36-34 (MEng);

Other qualifications: Scottish Advanced Highers, European Baccalaureate, BTEC ND, HND and HNC

Course places: 30

Manufacturing engineers are in great demand in the UK and abroad and the recent government initiatives and recruitment drives from industry are aimed towards emphasising the key role that manufacturing has in the global environment. In high value sectors such as aerospace, pharmaceutical, food, fast moving consumer goods employment of our graduates continues to be very strong and graduates are also highly attractive to companies in the financial and management consultancy sectors. This is because our degrees provide a wide range of key skills that teach manufacturing engineering skills in a business and management context with a strong emphasis on the needs of industry.

The essence of the degree programme is that manufacturing is about producing high quality products, with parts supplied in a competitive

global market, at the lowest cost and in the shortest time. From the first year of the degree you are taught both practical and theoretical engineering and management principles and application needed to develop and manufacture products and then the production systems needed to manufacture efficiently.

The skills that you develop can apply to any industrial sector and in fact, several companies including Rolls-Royce, Airbus and Procter and Gamble specifically target our graduates and view the degrees favourably. They also provide opportunities of MEng placements, projects and industrial visits and speakers, so presenting an industrially focussed and rich learning environment.

The degrees are also taught in partnership with the Nottingham University Business School and a key feature is the flexibility available in module and project options that enables you to tailor your degree to your specific interests and chosen career. There are also opportunities for you to study abroad or undertake a year or semester in industry.

Typical areas of study

Year one

In the first two years the course structure is the same for the BEng and MEng programmes. You are provided with a firm foundation in design, materials, manufacturing processes and operations management, underpinned by core modules in mathematics, statistics and engineering science.

Year two

Modules in manufacturing processes, design for manufacture and automated manufacture are taught alongside inventory management, business accounting and ergonomics and human factors in design. There are 20 credits of options to

develop particular manufacturing or management specialisms and a group-based design and manufacturing project is a key feature of the second year.

A group-based design and manufacturing project is undertaken in collaboration with an industrial activity and this is combined with visits to industrial companies. Students are also taught automated assembly and scheduling using our flexible automation teaching cell.

Year three

Following the choice of MEng or BEng at the end of year two the flexibility continues in year three with over 20 optional modules available to help students tailor their degrees to their own specific interests and career routes.

In the third year of the BEng all students undertake an individual project that accounts for 25 per cent of the year. Students can select their individual project with a research group in the department or with the University Business School and many of these projects are industrially related.

The MEng programme has a more industrially focussed theme with increased depth and breadth of specialist knowledge and understanding. In year 3 students have a range of specialist modules and visit and evaluate industrial companies .

Year four(MEng only)

Students are placed in industry for one semester and work on an individual industrial project. Recent companies have included Rolls Royce, Airbus, IMI, Network Rail, Jaguar – Landover etc and many students have been employed by the companies following the placement.

Biomedical Materials Science

UCAS code: BJ85

Duration: Three years (BSc)

Entry requirements: 3 A-levels including chemistry and one of either biology, physics or mathematics (excluding general studies)

Typical A level offer: BBB

Typical IB score: 30

Other qualifications: Scottish Advanced Highers, European Baccalaureate, BTEC ND, HND and HNC

Course places: 20

Biomedical industries provide a rich diversity of challenging scientific problems. These challenges may have a medical, biochemical or materials flavour, but the approach required to solve them is interdisciplinary, demanding an understanding of a range of concepts.

The industry is looking for multidisciplinary skills to develop products that are in contact with tissue. This requires expertise in materials science, biochemistry and cell biology. For example new degradable materials for bone plates and screws or smart stents for the cardiovascular system or anti-bacterial coated catheters for urology require understanding of the complex environment along with the unique physical and chemical properties of polymers and ceramics that can degrade. Just one application can be more than a billion dollar market. Hence the continual increase of the medical device and healthcare sector worldwide.

This BSc degree course integrates concepts from materials science and biochemistry with relevant cell biology providing the student with the ideal tools for the biomedical industry. Teaching is delivered in collaboration with the schools of biomedical sciences, pharmaceutical sciences and chemistry.

The course provides a balanced set of core modules giving a basic understanding of material, medical, biochemical and chemical sciences.

There are specific modules on medical materials and on the biological applications of biomaterials. The latter module links research at the cellular level with clinical applications of biomaterials and includes clinical visits to operations.

In the first and second years, the course is full of the relevant biochemistry, cell biology and materials science that is required to provide a solid base. The third and final year is dominated by a research project which is very popular with our students, many of whom go on to research careers.

Special features of the course

We have an ideal combination of scientists and engineers to deliver this multidisciplinary course. This is supported by the strong research base in bioengineering within the department. Outside speakers, surgeons and visits to operations are contained in the key modules specific to the course and allow students to experience the larger picture in biomedical materials science from medical and industrial viewpoints.

Typical areas of study

Year one

You will combine study of the structure and properties of materials, which include ceramics, metals and polymers, with cell biology and chemistry and an introduction to medical materials.

Year two

You will develop your materials knowledge to understand the interrelationship between the principle, processing and properties of materials and materials characterisation techniques. You will also study how biomaterials are formed into medical devices human physiology, protein function, immunobiology and further cell biology and biochemistry.

Year three

In this exciting year all your hard work is pulled together through (i) a cutting edge research project often within a team sponsored by industry or government funding and (ii) specific study of biological applications of biomaterials. These two areas cover approximately half the mark weighting for this year. The rest of your studies include modules on advanced materials and biomechanics with a range of options which you can tailor to your interests such as tissue engineering, drug delivery, fibre reinforced composites and further biology options. In addition to the normal modes of study you will attend medical device implantation operations, receive talks from surgeons and industrialists who use biomaterials in their work, and present your research both in a dissertation and as an oral presentation.

Graduate profile

Marcus Waite is an alumnus of The University of Nottingham after studying Mechanical Engineering BEng. Marcus has worked at McLaren Racing for the last 13 years, during which time he managed the test engineering department in Lewis Hamilton's championship winning year. Recently he helped to develop the MP4-12C and now works as the Chief Engineer at CRS Racing.

Did you know that a 10 per cent improvement in the complex and highly sophisticated relationship between downforce and drag on the wings of a Formula One car would translate into a one second improvement in lap time?

Marcus' role as a test Engineer is to develop the performance of Formula One cars through track testing. At all the Grand Prix around the world, Team McLaren Mercedes has a race team but in-between the races it is the test team which tests, probes and evaluates new suspension or new aerodynamic components – any slight improvement which will give their drivers the competitive edge and precious seconds of speed.

"I'd been interested in motor racing for some time and I'd wanted to get straight into the industry after leaving Nottingham but I realised I had to

take it step by step."

Like all engineers in the making, Marcus began repairing items at home until his projects became more and more complicated.

"It was a great opportunity to learn about all aspects of engineering through practical projects. I learned the traditional engineering skills of design and manufacture, as well as technical reporting and presentation skills. Nottingham offered a high quality and well respected course which also offered practical workshop sessions which were very good."

Marcus Waite

Senior Test Engineer, McLaren Racing
Chief Engineer, CRS Racing
Mechanical Engineering BEng (1996)



Marcus Waite with the McLaren MP4-12C that he helped to develop.

Careers

Our engineering degrees combine engineering science, design, business and maths, fully equipping you for a huge range of professional engineering careers and providing a sound basis for other career choices too.

All our engineering degrees (both BEng and MEng) are accredited by one or more engineering institutions thus supporting professional development. Through your studies you acquire not only an understanding of engineering principles but also a range of transferable skills ensuring Nottingham graduates are:

- Able to solve problems using both logic and creative/innovative approaches
- Numerate and highly computer literate, with excellent analytical skills
- Able to plan and prioritise, work to deadlines and deliver even under pressure
- Capable of careful attention to detail, exercising good judgement and accepting responsibility
- Able to communicate with others and work in multidisciplinary teams.

Our courses have a strong focus on preparation for professional practice: modules are designed to fulfil the requirements of the engineering institutions, projects often have direct industrial relevance and we both encourage and support industrial experience. Students also acquire an understanding of the commercial dimension of engineering, as well as its ethical and environmental implications. Our degrees are balanced and well-rounded and the majority of our graduates who do not continue in further education progress to professional careers in a wide range of engineering industries or in non-engineering sectors such as business, finance or consultancy.

Mechanical engineering

As one of the most diverse engineering disciplines, mechanical engineering deals primarily with the design, development, installation, operation and maintenance of anything that has moving parts. Because of its wide subject area, graduates find mechanical engineering opportunities in a range of sectors, including: aerospace; automotive; energy; railways; sport; medicine, manufacturing and construction.

Salaries

Range of typical starting salaries:
£14,000 - £31,000, (average £24,433)

HESA data

Mid-level salaries for lead/principle engineers with several years' experience:
£35,000 - £50,000

A senior mechanical engineer (10 - 15 years' experience can earn up to £55,000 plus

Product design and manufacture

This is our second largest course and graduates find employment in a wide range of fields. The course is particularly focussed on the aesthetic design and manufacturability aspects of product development. As well as being involved in the research, design and manufacture of the product, our graduates are also involved in commercial aspects such as sales and marketing, and logistics and supply chain.

Salaries

Range of typical starting salaries for a junior designer:
£14,000 - £20,000

Range of typical salaries with 10 years in the role:
£20,000 - £40,000

Senior product designers:
Approx. £65,000

Design engineering

Design engineering is a type of mechanical engineering course with enhanced design content and an integrated approach to functional performance, manufacturing, materials and lifecycle requirements. All companies involved in the manufacture and marketing of engineering products will require engineering designers and our graduates are additionally equipped for involvement in sales, marketing, logistics and supply chain.

Salaries

Range of typical starting salaries for an engineering designer:
£14,000 - £25,000

Range of typical salaries with 10 years in the role:
£20,000 - £40,000

Chief designer engineer:
Approx. £55,000 or more

Manufacturing engineering

Many of the challenges facing UK and global industry are manufacturing related and it is predicted that manufacturing will need an additional 324,000 scientists and engineers by 2014 (Manufacturing: New Challenges, New Opportunities, BERR, 2008). In addition to current industry requirements there is projected expansion in renewable energy and nuclear industries, clean technologies and products, biotechnology, electronics (including aerospace) and sections of the automotive industry.

Salaries

Range of typical starting salaries:
£14,000 to £23,000 (average £25,170)

HESA data

Range of salaries with several years' experience:
£25,000 to £38,000
(Graduate Recruitment Bureau, 2009).

Biomedical materials science

This course equips you for the rich diversity of challenging scientific problems within the associated industries. The industry is looking for multidisciplinary skills that require expertise in materials science, biochemistry and cell biology. Employers include the biomedical industry, medical device manufacturers, medical engineering and the pharmaceutical industry as well as more general engineering/materials careers.

Salaries

Range of typical starting salaries for a materials engineer:
£20,000 - £26,000

A senior materials engineer (10-15 years' experience) could earn up to £60,000

Note: Unless stated otherwise, all salary data taken from www.prospects.ac.uk (Sep 2011)

Applying for a place

All applications for undergraduate courses at Nottingham must come through the Universities and Colleges Admissions Service (UCAS), whose website is www.ucas.ac.uk. The UCAS deadline for applications is usually 15 January.

Make sure you write the code relating to the course you want to study on the UCAS application form – all the codes for our courses feature on page 11 of this brochure. The UCAS code for The University of Nottingham is N84.

We look at every application individually. When we receive your application from UCAS, our subsequent decision will be based on academic potential and personal qualities, along with your previous academic record and referee's statement.

International students

In most cases, international students can apply for courses right up until the summer. International students should also apply through UCAS. Your school, an agent or your local British Council can help you with the UCAS application process. The UCAS website has a useful step-by-step video guide for international undergraduate students: www.ucas.com/students/wheretostart/nonukstudents

Mature students

We want to widen participation in our courses as far as possible; therefore, our admissions are more flexible if you're a mature student. Please contact the Admissions Tutor before applying through UCAS.

English as a second language

International students whose first language is not English must have an appropriate level in an approved test, for example:

- IELTS 6.0 (no less than 5.5 in any element)
- TOEFL iBT 87 (with no less than 21 in listening, 22 in reading, 23 in speaking and 21 in writing)
- Pearson Test of English Academic (PTE Academic) 55 (min 51)

If you have not reached the IELTS or TOEFL score you could apply to attend a full-time English language course at the University's Centre for English Language Education (CELE) before registering for your degree. For more information see www.nottingham.ac.uk/cele

For information on English language requirements visit www.nottingham.ac.uk/ugstudy/applying/entryrequirements.aspx

Biomedical Materials Science student Ama Frimpong using a moulding rig for polymers.



Fees and funding

UK and EU students

In April 2011, The University of Nottingham announced plans to set undergraduate fees at £9,000 from 2012, subject to agreement by the Office for Fair Access (OFFA). The fees will apply to full-time UK and EU students on all undergraduate degree courses.

A substantial and increased package of financial aid will be available to students to ensure that the University continues to attract the best and the brightest students, whatever their background. Well over a third of our students will be eligible for our core bursaries, which offer up to £3,000 for each year of undergraduate study.

This broad and progressive package of financial aid will include direct support for students' living costs and additional provision will be targeted towards foundation-year students, local students, students with disabilities, those with responsibilities as carers and students formerly in care.

Information about fees, including a frequently asked questions section, can be found on www.nottingham.ac.uk/fees

International students

The increases in University tuition fees does not apply to international students. International tuition fees for students commencing their studies from 2012 onwards will continue to be subject only to a small inflationary increase each year. The University operates a fixed tuition-fee policy where students pay the same fee level for the duration of their studies. Details of tuition fees and scholarships for international students will be published on www.nottingham.ac.uk/fees

Faculty of Engineering undergraduate scholarships

The Faculty of Engineering is keen to attract students who are determined to do the best for themselves and we are committed to supporting them on their path to success. We have developed a generous package of scholarship, details of which can be found on www.nottingham.ac.uk/engineering/funding

“We are currently investing £90m in teaching and learning to ensure that our students continue to enjoy the very best facilities during their studies at The University of Nottingham. The new fee levels we are proposing will allow us to replace the cuts in government expenditure and build on this investment, and build on what we can offer to students who aspire to a world-class education, while maintaining the financial sustainability of the University”.

Professor David Greenaway
Vice-Chancellor, The University of Nottingham

Fourth year mechanical engineering student, Shawn Jackson, working on a Formula Student racing car.



Frequently asked questions

Can I live in halls of residence or other University accommodation?

All full-time first-year students are guaranteed a place in University accommodation provided they make Nottingham their firm choice and return their accommodation application before the 1 August deadline. For more details please see www.nottingham.ac.uk/accomodation

A wide variety of privately managed accommodation is available within walking distance of the Department and University facilities.

Can I take a year in industry?

You will be encouraged to undertake industrial placements, usually at the end of year two. 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 'Year in Industry' scheme 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

Can I study abroad as part of my degree?

You will be able to study at the University's Malaysia Campus or partner universities in the USA, Australia or Canada. Our Malaysia Campus offers the same course programme as in the UK and all teaching is done in English.

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 20 per cent of the course.

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 assigned to act in a pastoral role if necessary.

Will I get exposure to industry?

Industry is at the heart of everything we do. Staff have industrial backgrounds or work with industry on a day-to-day basis through their research activities. Our labs mirror many industrial processes and we use guest lecturers to deliver material within several course modules. We run a programme of industrial visits and most of our modules involve industrial case studies.

What are the job prospects at the end of the course?

The majority of our students who want jobs get them within six months of the end of their course. Many get head-hunted well before the end of their final year. Our engineering degrees offer excellent and varied careers. Their analytical, team-working and problem-solving nature means they are in demand from non-engineering sectors (for example, management and finance) as well as in technical scientific and engineering roles.

Can I switch between courses?

You will be able to switch between BEng and MEng degrees at the end of year two. You will need an overall average of 55 per cent at the end of year two in order to qualify for the MEng

I haven't studied the correct subjects-is there any way I can do engineering?

If you have not studied maths, chemistry or physics at A level you could consider applying for the Engineering Foundation Year Programme. For more details, please see www.nottingham.ac.uk/foundation_year

Mechanical Engineering student Emily Chruscikowski recently took part in a year long exchange to the University's Malaysia campus.



Group of friends walking from the Trent Building on an Undergraduate Open Day.

Visiting and contacting us

We are always keen to welcome prospective undergraduates and their families onto our beautiful campus, be it on one of our open days, a campus tour day, or any other day of the week.

UCAS visit days

After a preliminary selection, applicants will be invited to join one of our UCAS visit days. These provide an opportunity to tour the Department and the University campus. They also include a visit to a hall of residence, as well as interviews with members of academic staff. There are presentations on the University, departments and courses and a special programme for parents and guardians. You will also be able to talk to current students.

Open days

We recommend that you attend one of the University-wide open days, held every year in June and September. That way you can see for yourself the wonderful campus and meet staff and current students. Find out more www.nottingham.ac.uk/opendays

Campus tour days

The University runs tours of University Park Campus on some Wednesdays throughout the year. For further information or to book a place on a campus tour day, please contact the Enquiry Centre:
t: +44 (0)115 951 5559 or
e: undergraduate-enquiries@nottingham.ac.uk

If you require this publication in an alternative format, please contact us.
t: +44 (0)115 951 4591
e: alternativeformats@nottingham.ac.uk

Paper made from FSC accredited 100 per cent recycled material.

Contact us

For further information please contact:
Department of Mechanical, Materials and Manufacturing Engineering
The University of Nottingham
University Park
Nottingham
NG7 2RD
e: m3-undergraduate@nottingham.ac.uk
w: www.nottingham.ac.uk/m3

For additional general information for international students, 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 follow us through our social media channels, all of which can be accessed via www.nottingham.ac.uk/connect